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ABSTRACT

This volume is the last of four sets of materials produced for training science supervisors in educational technology. It describes the contents and use of kits designed to help supervisors analyze their jobs in five basic supervisory areas: budget; equipment, supplies, and materials; optimum learning systems; provision of services to science teachers; and reports. The necessity to relate these functions to improved student learning is emphasized. A bibliography is appended. Examples of management systems developed by science supervisors, samples of charts, and a copy of the criterion assessments used as follow-up activities are included as appendices to the report. (AL)

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EDUCATIONAL TECHNOLOGY PROJECT

ED044289

MANAGEMENT KIT SET IV

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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VOLUME FIVE

SE 009 861

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1201 Sixteenth St., N.W., Washington, D.C. 20036

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
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F I N A L R E P O R T

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V O L U M E F I V E

MANAGEMENT KIT (SET IV)

Educational Technology Project
National Science Teachers Association
Washington, D.C. 20036

February 1970

U.S. DEPARTMENT OF
HEALTH, EDUCATION, & WELFARE
OFFICE OF EDUCATION
BUREAU OF RESEARCH

Set IV consists of a Management Kit.
The original version was conceived
and developed by

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INTRODUCTION

The purpose of this kit is to help you analyze your job as it now exists. As a result of many work sessions, science supervisors developed this manipulative format to articulate and visualize management responsibilities.

Five basic science supervisory areas are included:

Budget

Equipment, Supplies, & Materials

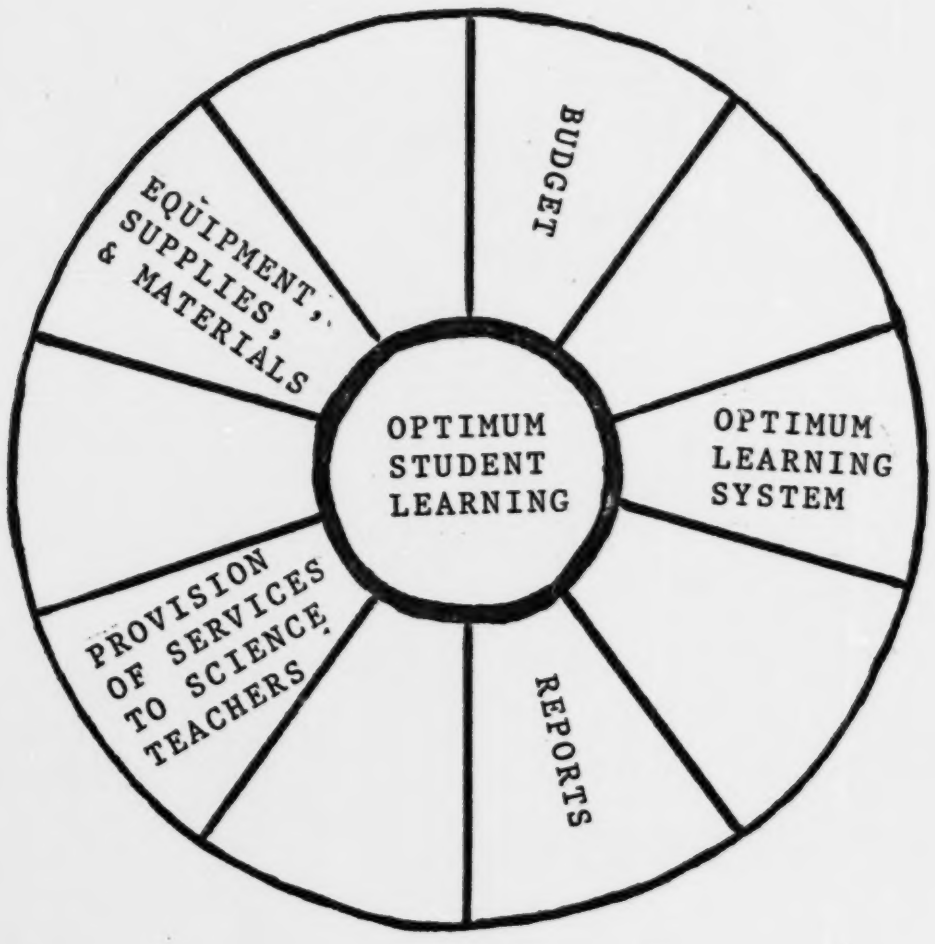
Optimum Learning System

Provision of Services to Science Teachers

Reports

These five areas do not include all activities of a science supervisor, but they do represent the most important <u>management</u> functions (goals) of supervisors as determined by supervisors themselves.

Emphatically, each of these functions <u>must</u> result in improved student learning. Otherwise, as often happens with the pressures of daily activity, these functions become ends in themselves. In utilizing this kit these functions may be visually represented as the spokes in a wheel all leading to optimum student learning.



In using this kit, you will prepare flow chart of activities and events (checkpoints) in the five supervisory areas. The materials in this kit are to assist in a visual analysis of your management responsibilities. Included are instructions to make that analysis as effective as possible.

Don't start to play until you can devote at least two uninterrupted hours to the task. You will need a large table and an audio tape recorder with enough tape for 60 minutes of recording.

When you are ready to start, turn the page and follow the instructions carefully.

INSTRUCTIONS FOR UNIT I

This first unit will provide directions and materials for a flow chart of your activities in any one of the five management goals. In addition the resulting chart will provide a linear time sequence of activities which will form the basis for Unit II activities. If this activity is carried out with others in the same room, it would be better /3
to prepare your <u>own</u> chart before comparing activities with others. The purpose is to prepare a chart of your own activities that will form a basis for future analysis and revision. Before changing, it is necessary to have a starting point: a basis for change.

Note: If you are in a group, spread out; unit I requires room.

Initial Activity

1. Open the Management Kit. Enclosed you will find all of the items noted in the "List of Supplies." (Appendix A)

2. From the five triangles (terminal goals) select the one you want to start with and put it at the far right end of the table. Put the other triangles back in the Management Kit.

3. Pick up the printed squares (checkpoints) and select any of these which you consider relevant to the process of reaching the selected terminal objective.

4. Put the balance of the checkpoints (squares) back into the Management kit.

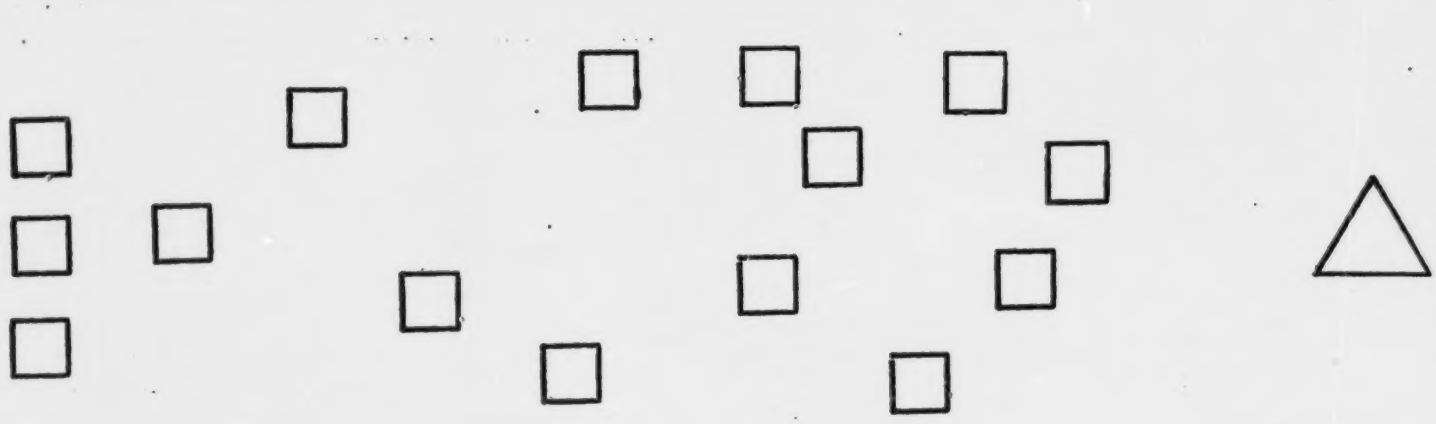
5. Keep the blank squares out and put them in an easy-to-reach place.

6. Return all additional materials to the Management Kit.

Operation

Spread out all selected checkpoints (squares) on top of the table. Now, arrange them in sequential order leading to your goal (triangle). (e.g., which comes first, mailing the letter or typing it?) You may find it easier to start with the goal at the far right and work backwards. If you find any gaps (missing checkpoints) use the blank squares to make your own. Since this unit involves your own activities do not hesitate to add any checkpoints you feel are necessary. /5

The arrangement of checkpoints does not have to be linear (except in time) Create any pattern best suited for your situation. For example, the pattern might look something like this:



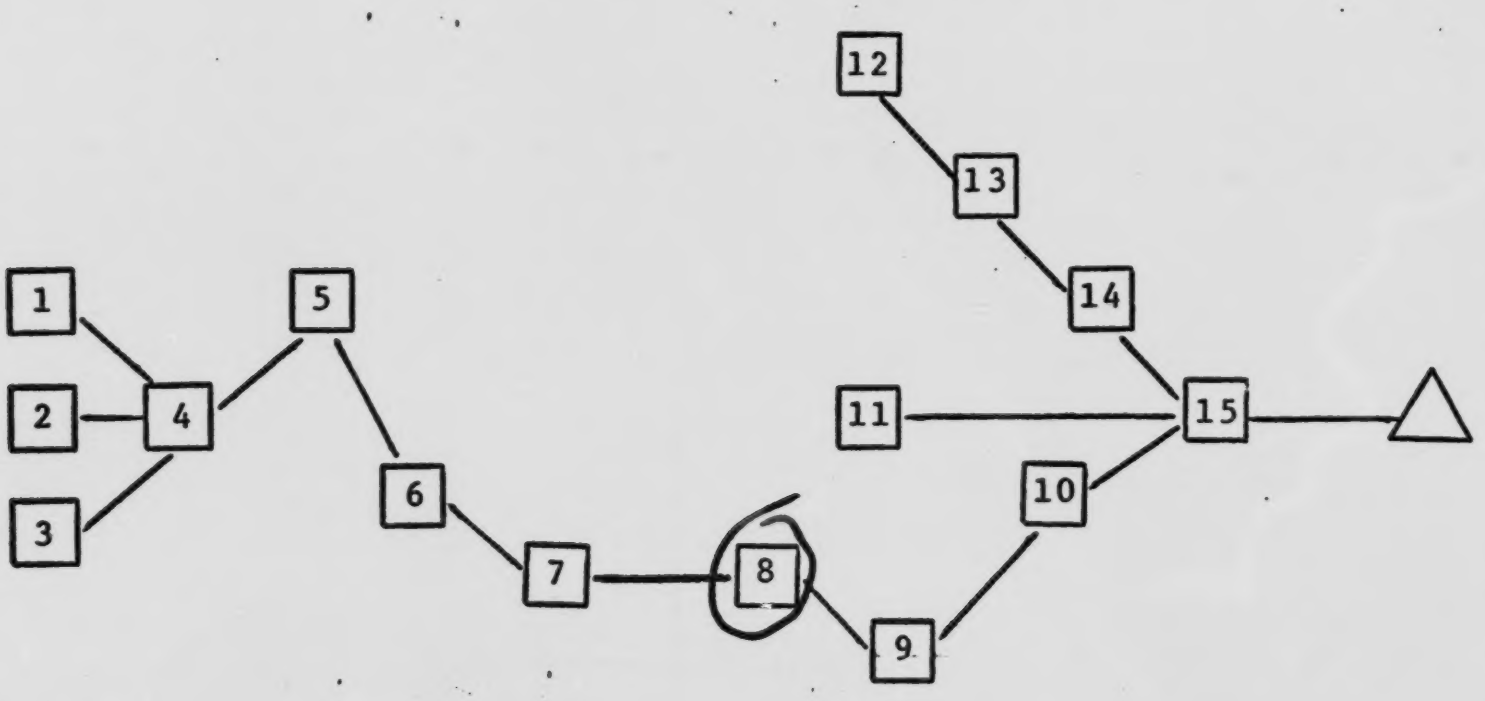
Here are some guidelines to help you.

1. Each checkpoint has a beginning and an ending.
2. The activities involved in reaching each checkpoint will be considered later.

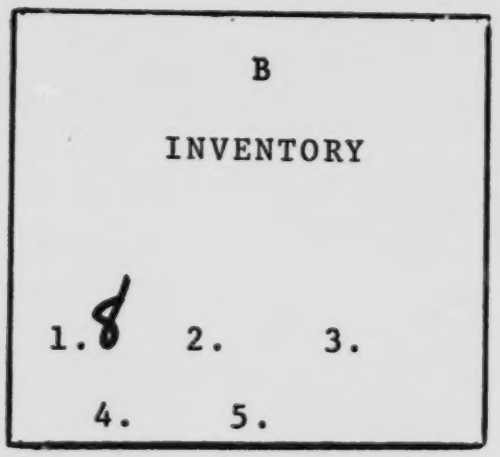
When all the checkpoints have been arranged in a pattern leading toward the goal, turn the page.

Take the toothpicks out of the Management Kit. These are the activity connectors. Use them to show the activities leading from checkpoint to checkpoint toward the goal.

Here is one example of a finished product.



When your pattern is complete, select the colored pen that matches the colored paper on which the goal is printed. Now give each checkpoint card a position number (see above), moving across the table from left to right. Insert the position number beside the appropriate goal number which is already printed on the checkpoint card. For example, on the checkpoint card "Inventory" (at the right), the position number "8" was written beside the appropriate goal number (number "1" which stands for the goal "Reports").



Checkpoint card indicating method of inserting position number.

Take the following items from the Management Kit:

1. The sheet of paper (8½" X 14") of the same color as the triangle on which the goal is printed.

2. The black pen.

3. The square template.

4. The yellow lined pad.

/7

Using these supplies, copy onto the colored paper the pattern you have developed. Follow these descriptive guidelines:

Description of Checkpoints Networks.

A. Composed of Events (checkpoints) and Activities.

1. The squares represent the Checkpoints.

2. The lines represent the Activities.

   a) Solid line ——— an activity.

   b) Dotted line ------ a dummy activity; no time required from event to event.

      For example, any event which really forms a part of something else: replacement parts (events) are necessary to an inventory (event) but once you have listed them they are a part of the inventory. No specific activity is required for this.

B. Ground Rules.

1. An event can occur only <u>once</u> in a network.

   a) Event has a beginning.

   b) Event has an end.

   c) Activity runs from the beginning to the end.

2. There can be no return to an event in the network once it has ended.

/8

Use the template to draw the lines represented by the tooth-picks. Be sure to identify each of the squares on your drawing with both its position number and capital letter (at top). Use the yellow lined pad to list the numbered check-points in your pattern.

When the drawing is complete, get a tape recorder and explain the chart you have developed. Some find it helpful to have another person listen to the explanation; others prefer to do it in solitude. * Take your choice and, when finished, take a break.

---

* If you do not have a tape recorder write out the briefing as if it were a memo explaining your chart to another science person.

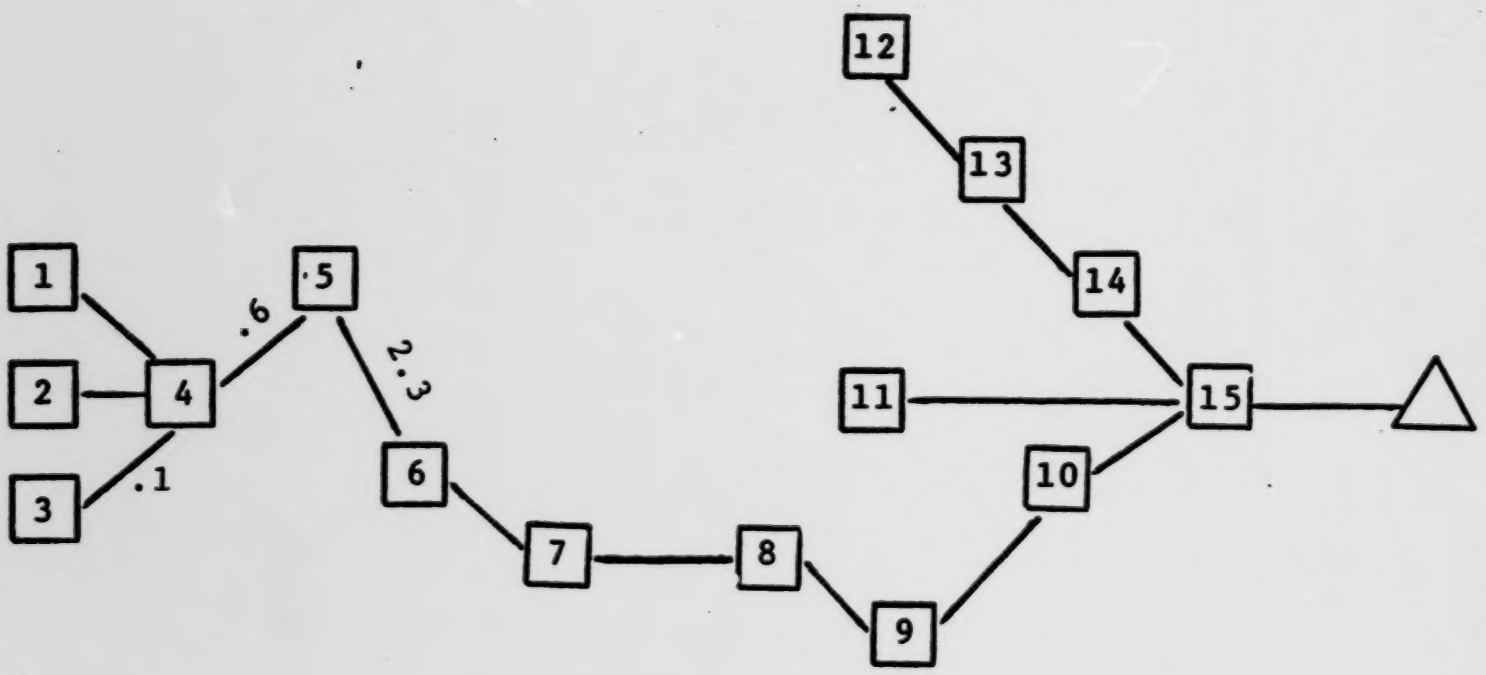
INSTRUCTIONS FOR UNIT II

After you have copied your flow chart and completed the verbal description, you are ready to assign times to your activities. Solid lines on your chart represent elapsed time.

Each activity requires some amount of time for completion. /9

The estimated time required is written on the line; e.g., one week equals 1.0 (a five-day week), one day equals 0.2.

One word of caution at this point, your chart need not have a standard time scale:



At this point feel free to change any lines from dotted to solid or vice versa.

Your flow chart now shows the events, activities, and time estimates for one terminal management goal. You have two options at this point: repeat Unit I and II for the other four terminal management goals, or continue to Unit III.

The choice is yours.

/10

INSTRUCTIONS FOR UNIT III

At this point, you have completed at least one of the flow charts leading to a terminal management goal. All of the work up to now is yours and should reflect your real world activities.

In this unit you will have an opportunity to interact with other points of view. The unit may be taken either alone or with other science supervisors. /11

Remember - your chart represents your real world activities - it is not intended to be a textbook model. As a result, no two charts will have more than a general resemblance. This does not make one chart right and another wrong.

Be prepared to seek new areas of activity and new approaches to similar areas. But also, identify your own strengths.

The result of this interaction activity will be a strengthening of your own flow chart.

If you are working alone on Unit III, skip the steps under group activity and proceed to individual activity.

Group Activity

1. Keep the group small; three people maximum.

2. Pick the one terminal management goal for which everyone in the group has developed a flow chart (Unit I).

3. Spread out the charts and give one another the tape recorded or written briefing prepared to describe the chart (Unit I). /12

4. Question, defend, and discuss each chart in turn, making notes about some of the major differences in the charts. Take as much time as you wish.

5. Make any changes you wish in your original flow chart. Do these with a different colored pen.

6. You may not continue as a group or separate. In either case, continue with the following steps under individual activity.

Individual Activity

1. Pick one terminal management goal for which you have done a flow chart.

2. From the kit select the brown envelope labeled with the terminal management goal you selected. This envelope contains a conglomerate flow chart incorporating charts from other supervisors. /13

3. Spread your chart near the chart from the envelope.

4. This chart does not have a prepared audio tape or written briefing similar to yours. Prepare a briefing for it using a tape recorder or write it on the yellow pad.

5. Identify the major differences in arrangement of activities and checkpoints between your chart and the other chart (through comparing charts and briefings).

6. Make any changes you wish in your own original flow chart. You might wish to draw a new flow chart incorporating these changes.

   Remember changes must be realistic. The resulting chart is yours, not a theoretical model.

If you have flow charts for the remaining terminal management goals, repeat Unit III using these charts. If not, go back to Units I and II and complete your remaining charts.

When you have completed Units I, II, and III for all five goals, go on to Unit IV. /14

INSTRUCTIONS FOR UNIT IV

Unit IV may be taken in a small group or individually. The purpose of this unit is to identify critical checkpoint areas. Once these areas have been identified they can be expanded in depth and weak points strengthened. Again, as in all other units, all of the activities must meet <u>your</u> needs. A critical checkpoint is one which is critical to <u>your</u> flow chart. A weak area is where you have identified the need for reinforcement. /15

1. In Unit I you placed the location of the checkpoint in a flow chart next to the number of the terminal management goal. Go through the checkpoints and sort them into piles according to the number of flow charts in which the checkpoint appears. (You should have six piles, 0 - 5.)

2. For the moment, take only the last two piles (e.g., 4 and 5). These checkpoints are of continuing importance since they appear in almost every flow chart.

3. Using the attached sheets as models, break down the checkpoints in detail.
(Example, what goes into the monthly staff meeting? What is involved in organizing a journal club?)

4. Only you can identify areas of weakness in your activity. The attached sheets and the bibliography following are intended as general aids and information. They were developed through using the kit with a number of science supervisors at all levels. Areas that appeared consistently have been emphasized.

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From this point on you are on your own. If you have any comments or suggestions, let us know. We would appreciate copies of your revised flow charts and briefings, along with any other material you care to add.

SAMPLE CHECKPOINT BREAKDOWNS

CHECKPOINT CA

1. Presentations to Community Groups.
    - 1.1 Involve Attendees.
        - 1.1.1 Pre and Post Test.
        - 1.1.2 Demonstration - ice example.
        - 1.1.1 Shocking statements - heat example.
    - 1.2 Utilization of Media (equipment) desired in school by you in presentation
        - 1.2.1 Getting loan of equipment from supply house.
    - 1.3 Student Demonstration.

/1

CHECKPOINT AU

1. Professional Development.
    - 1.1 Membership in Teacher Organizations, Unions, etc..
    - 1.2 Encourage staff participation in N.E.A., particularly N.S.T.A..
    - 1.3 Release time and/or monetary contributions for graduate study.
    - 1.4 In-service workshops, institutes, conventions, meetings, exhibits.
    - 1.5 Professional library and resource materials.

SAMPLE CHECKPOINT BREAKDOWNS

CHECKPOINT AC

1. Staff Meetings.

    1.1 To develop plans for science competition.

    1.2 To develop plans for Parents Day.

    1.3 To plan remedial action for weakest areas of student learning.

    1.4 To consider complaints received from parents or PTA.

    1.5 To consider requests from administration.

    1.6 To review public relations feedback.

    1.7 To discuss and evaluate validated learning systems and mediated materials.

CHECKPOINT BO

1. Journal Clubs.

    1.1 To prepare recruitment material.

    1.2 To list the scientific journals to be used.

    1.3 To establish schedule of monthly meetings.

    1.4 To select articles to be reviewed at the first meeting and to assign these to "reviewers".

    1.5 To record or collect written reviews and compile them for memographed "Digest".

    1.6 To distribute "Digest" to all science teachers, to NSTA, and to administration.

SAMPLE CHECKPOINT BREAKDOWNS

CHECKPOINT AQ

1. Conferences and Counseling Sessions With Science Teachers.

    1.1 To discuss individual's strengths and weaknesses.

    1.2 To consider physical and mental health of the individual.

    1.3 To listen carefully to, make note of, and follow-up on suggestions and complaints of each.

    1.4 To assist the teacher in finding best approaches to problem solving.

APPENDIX A

LIST OF SUPPLIES

Five (5) colored triangles.

(Each triangle is printed with one terminal management goal and a number identifying that objective.)

Ninety-One (91) white squares.

(Each square is printed with a checkpoint, numbers 1, 2, 3, 4, 5, goals, and a capital letter.)

/20

Twenty (20) blank white squares.

Five (5) colored felt tip pens.

(Pink, yellow, green, blue, orange.)

One (1) bundle wooden toothpicks.

One (1) square template.

Ten (10) sheets 8½" X 14" paper.

(Blank, two sheets in each color: pink, yellow, green, blue, orange.)

Three (3) blank sheets 20" X 30" newsprint.

One (1) black felt tip pen.

One (1) lined yellow pad.

APPENDIX B

LIST OF "CHECKPOINT" SQUARES

A	CLERICAL SUPPORT
B	INVENTORY
C	DISTRIBUTION TO TEACHERS
D	PROCUREMENT OF BIDS
E	IDENTIFICATION OF UNMET NEEDS
F	REPAIRS AND REPLACEMENTS
G	DETERMINATION OF NEEDS
H	RESEARCH REVIEW
I	BUDGET
J	INVOLVEMENT OF FACULTY
K	COMPARISON OF NEEDS TO BUDGET
L	ASSIGNMENT OF PRIORITIES
M	RECEIVING INSTRUCTIONS
N	REQUESTS FOR ASSISTANCE
O	ADMINISTRATIVE BRIEFING
P	MAINTENANCE
Q	ORDERING
R	DISCUSSION OF BUDGET
S	MEMORANDA & LETTERS
T	COMPETITIVE TEAM IN STATE CASH AWARDS USED FOR EQUIPMENT
U	PERUSING CATALOGS
V	VISITS TO SCIENCE CLASSROOMS
W	TALKING TO SALESMEN
X	VISITING OTHER DISTRICTS (OR STATES)
Y	"SHARING" LIMITED EQUIPMENT
Z	CHECKING DELIVERIES

AA	VISITING EXHIBITS
AB	EVALUATION OF STUDENT LEARNING (QUANTITATIVE & QUALITATIVE)
AC	STAFF MEETINGS
AD	TESTING & VALIDATION
AE	STATISTICAL SUMMARIES
AF	TELEPHONE CONFERENCES
AG	SUGGESTIONS FROM ADMINISTRATORS
AH	BASIC LEARNING PROGRAM DEVELOPMENT
AI	REQUESTS FROM ADMINISTRATORS
AJ	HUMAN REPAIR & MAINTENANCE
AK	DAILY DIARY
AL	PROGRESS REPORT
AM	EXPLANATION OF WRITTEN REPORTS
AN	ORIENTATION OF NEW FACULTY
AO	PREPARATION FOR VOCATIONAL TRAINING
AP	IN-SERVICE TRAINING
AQ	CONFERENCES OR COUNSELING SESSIONS
AR	ACTION RESEARCH
AS	PLANNING FUTURE PROGRAMS
AT	JOB ASSIGNMENTS
AU	PROFESSIONAL DEVELOPMENT
AV	STAFF EVALUATION
AW	ANECDOTAL RECORDS
AX	COMMITTEE ASSIGNMENTS
AY	JOB VACANCIES
AZ	ORAL INTERVIEWS

BA	INTERIM REPORTS
BB	ANNUAL REPORT
BC	CONVENTIONS, INSTITUTES & WORKSHOPS
BD	TEACHER DESIRES
BE	TEACHER ABILITIES
BF	GRADUATE STUDIES
BG	PUBLIC RELATIONS FEEDBACK
BH	P.T.A. OR PARENT COMPLAINTS
BI	UNSATISFACTORY OR QUESTIONABLE EVALUATION OF STUDENT LEARNING
BJ	TEACHING RESPONSIBILITIES
BK	APPLICATION EVALUATION
BL	GETTING KIDS INTO COLLEGE
BM	TRADE MASTERY
BN	SUGGESTIONS OF FACULTY MEMBERS
BO	JOURNAL CLUBS
BP	IMPLEMENTATION OF LEARNING SYSTEM
BQ	STUDENT GUIDANCE
BR	INVOLVEMENT OF PARENTS
BS	SUGGESTIONS OF STUDENTS
BT	SUGGESTIONS OF PARENTS
BU	DETERMINATION OF WHAT WE WANT STUDENTS TO LEARN
BV	INVOLVEMENT OF STUDENTS
BW	NO APPLICATION OF APPROVED & VALIDATED SYSTEM OR MEDIATED MATERIALS
BX	BEST PRACTICES NEWS LETTER
BY	CONTINUING EDUCATION
BZ	SUGGESTIONS OF COMMUNITY

CA PRESENTATIONS TO COMMUNITY GROUPS

CB EQUIPMENT, MATERIAL, & SUPPLIES

CC PERSONNEL REPORTS

CD STAFF SELECTION

CE TEACHER AIDES

CF STAFF COMMUNICATIONS

CG APPLICATION OF VALIDATED LEARNING SYSTEMS & MEDIATED MATERIALS

CH REMEDIAL PLANS

CI EQUIPMENT SPACE

CJ PROFESSIONAL ASSOCIATIONS & JOURNALS

CK EQUIPMENT UTILIZATION

CL PROPOSAL PREPARATION

CM VALIDATION OF NEW LEARNING MATERIAL

APPENDIX C

B I B L I O G R A P H Y

Use of Systems Approach for Management Activity

Clyde Carter, "What Management Techniques Can the School Learn from Industry?" (Paper presented at the North Central Association Annual Meeting, March 26, 1969.), North Central Association Quarterly, 43:4 (Spring 1969), pp. 353-60.

Desmond L. Cook. Program Evaluation and Review Technique: Applications in Education, Cooperative Research Monograph No. 17. Washington D.C.: U.S. Department of Health, Education, and Welfare, Office of Education, 1966. (Government Printing Office #FS5.212:12024)

Leonard C. Guy, "Simulated Management," Library Journal, 94:1 (January 1969), pp. 37-41.

Harry J. Hartley, "Santayanan-Weberian Reason in Administration," Journal of Educational Administration, 7:1 (May 1969), pp. 45-56.

Harry J. Hartley, "Limitations of Systems Analysis," Phi Delta Kappan, 50:9 (May 1969), pp. 515-19.

C. Kenneth Tanner, "Techniques and Application of Educational Systems Analysis," Audiovisual Instruction, 14:3 (March 1969), pp. 89-90.

Provision of Services to Science Teachers (especially related to goal two)

William Ammentorp and others, "Prerequisites for Systems Analysis--Analytic and Management Demands for a New Approach to Educational Administration, "Educational Technology 9:8 (August 1969), pp.44-7.

G. Ernest Anderson, Jr., "Simulation Model Helps Plan Teacher Training Program," Nations Schools 83:4 (April 1969), pp. 90-2.

Joanne I. Bell. Staff Development and Practice Supervision: Criteria and Guidelines for Determining Their Appropriate Functions. Washington, D.C.: U.S. Department of Health, Education and Welfare, 1968. (Government Printing Office #0-309-429)

Provision of Services to Science Teachers Continued

Martin M. Bruce. Human Relations in Small Business, Small Business Management Series No. 3, third edition. Washington, D.C.: Small Business Administration, 1969, 38 pages. (Government Printing Office #0-356-552)

N. Richard Diller, "The Management of Professional Educators; Management Development Needs in the Education Field," Training Development Journal, 23:5 (May 1969), pp. 48-9.

Cleone L. Geddes and Beverly Y. Kooi, "An Instructional Management System for Classroom Teachers," Elementary School Journal, 69:7 (April 1969), pp. 337-45.

E. W. Menzel, "Science Teaching and Sensitivity Training?," Science Teacher, 36:8 (November 1969), pp. 17-20.

Robert S. Randall, "An Operational Application of the CIPP Model for Evaluation," Educational Technology, 9:7 (July 1969), pp. 40-4.

Martin I. Taft, "A Systematic Method for Evaluating Teachers," Journal of Engineering Education, 59:7 (March 1969) pp. 852-7.

Budget and Reports (especially related to goals one and three)

G. Robert Cope, "Simulation Models Should Replace Formulas for State Budget Requests," College and University Business, 46:3 (March 1969), pp. 30-4.

Harry J. Hartley, "PPBS and Cost Effectiveness Analysis," Educational Administration Quarterly, 5:1 (Winter 1969), pp. 65-80.

Richard Millard, "Program Development and Budgeting: PPBS (Summary of report on study entitled Planning for Educational Development in a Planning, Programming and Budgeting System, by Selma Mushkin, Education Commission of the States Steering Committee meeting, December 1968)," Compact 3:1 (February 1969), p. 12.

Charles C. Poindexter, "Planning-Programming-Budgeting Systems for Education," High School Journal, 52:4 (January 1969), pp. 206-17.

Equipment, Supplies, and Materials (especially related to goal five)

The Audio-Visual Equipment Directory: A Guide to Current Models of Audio-Visual Equipment. Fairfax, Virginia: National Audio-Visual Association, Inc. ($7.00)

An annual directory, produced by the trade association of audiovisual hardware manufacturers, includes pictures and specifications of the equipment.

Audiovisual Marketplace: A Multimedia Guide, second edition. New York City: R. R. Bowker Company, 1970. ($12.25)

The most comprehensive directory of hardware and software manufacturers/producers/distributors. Includes listings of media organizations, periodicals, film libraries, educational radio and television stations.

Educators Guide to Free Science Materials. Randolph, Wisconsin: Educators Progress Service, 1968. ($8.25)

Lists free films, filmstrips, tapes, transcriptions, and other printed material.

Carl Hendershot. Programmed Learning: A Bibliography of Programs and Presentation Devices, fourth edition. Bay City, Michigan: Carl Hendershot, 4114 Ridgewood Drive. ($27.50, including supplements through June 1970)

Index to 16mm Educational Films, second edition. New York City: R. R.Bowker Company, 1969. ($38.50)

Contains 35,000 entries for commercially available 16mm films. More than 10,000 entries in the natural and physical sciences.

Index to 8mm Educational Film Loops, first edition. New York City: R. R. Bowker Company, 1969. ($16.00)

Approximately 10,000 entries for commercially available 8mm film loops.

Index to 35mm Educational Filmstrips, second edition. New York City: R. R. Bowker Company , 1969. ($34.00)

Some 25,000 entries.

Equipment, Supplies, and Materials Continued

Index to Educational Transparencies, first edition. New York City: R. R. Bowker Company, 1969. ($20.00)

Some 15,000 entries.

Harris H. Shettel and Pamela C. Reilly, "Evaluation of Existing Criteria for Judging the Quality of Science Exhibits," AV Communication Review, 14:4 (Winter 1966), pp. 479-488.

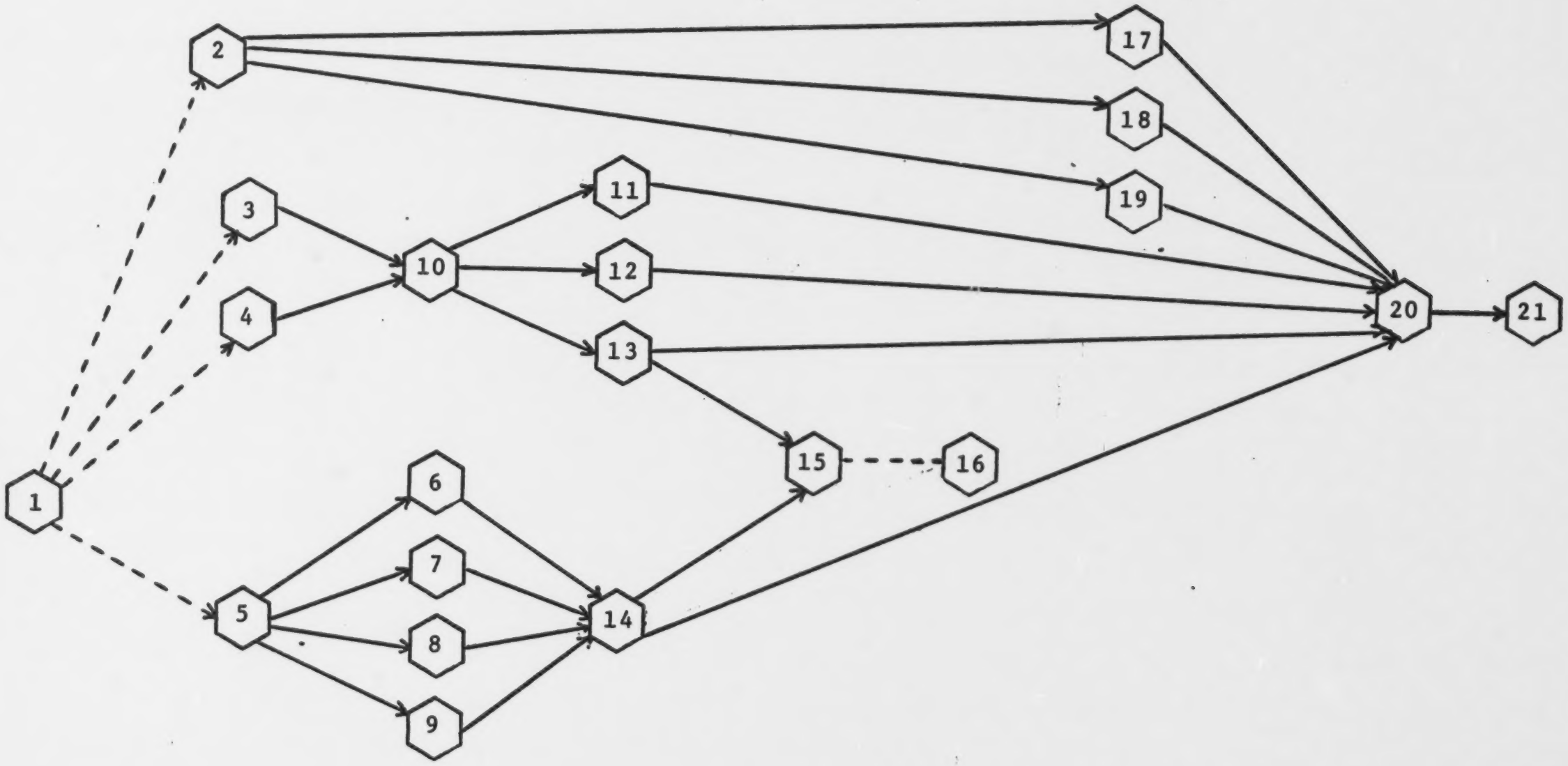
A P P E N D I X D

MODEL SYSTEMS DEVELOPED BY SCIENCE SUPERVISORS

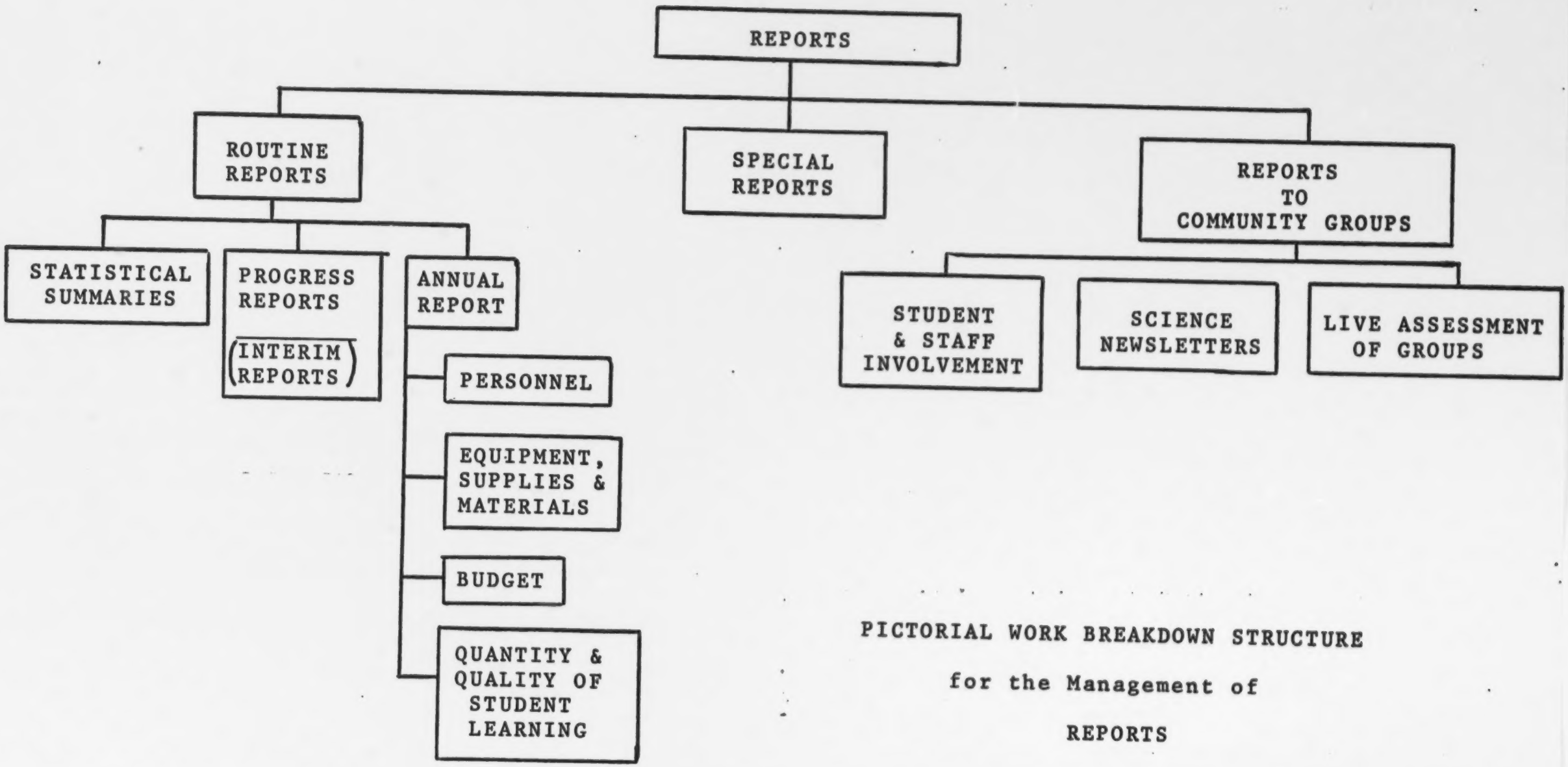
FOR USE IN UNIT III

MODEL 1: REPORTS

Model Sequential Order	Model Checkpoint	Capitol Letter of Management Game
1.	Begin Report	
2.	Clerical Support	A
3.	Daily Diary	AK
4.	Anecdotal Records	AW
5.	Begin: Staff Contributions	BN
6.	Staff Meetings	AC
7.	Journal Club Meetings	BO
8.	Conferences	AQ
9.	Correspondence	S
10.	Staff & Student Evaluation	AB AV
11.	Personnel Reports	CC
12.	Budget	I
13.	Equipment, Supplies & Materials	CB
14.	Quality & Quantity of Student Learning	AB
15.	Suggestions of Community	BZ
16.	End: Staff Contribution	
17.	Statistical Summaries	AE
18.	Requests from Administration	AI
19.	Progress Report	AL
20.	Annual Report	BB
21.	End: Reports	



R E P O R T S



PICTORIAL WORK BREAKDOWN STRUCTURE

for the Management of

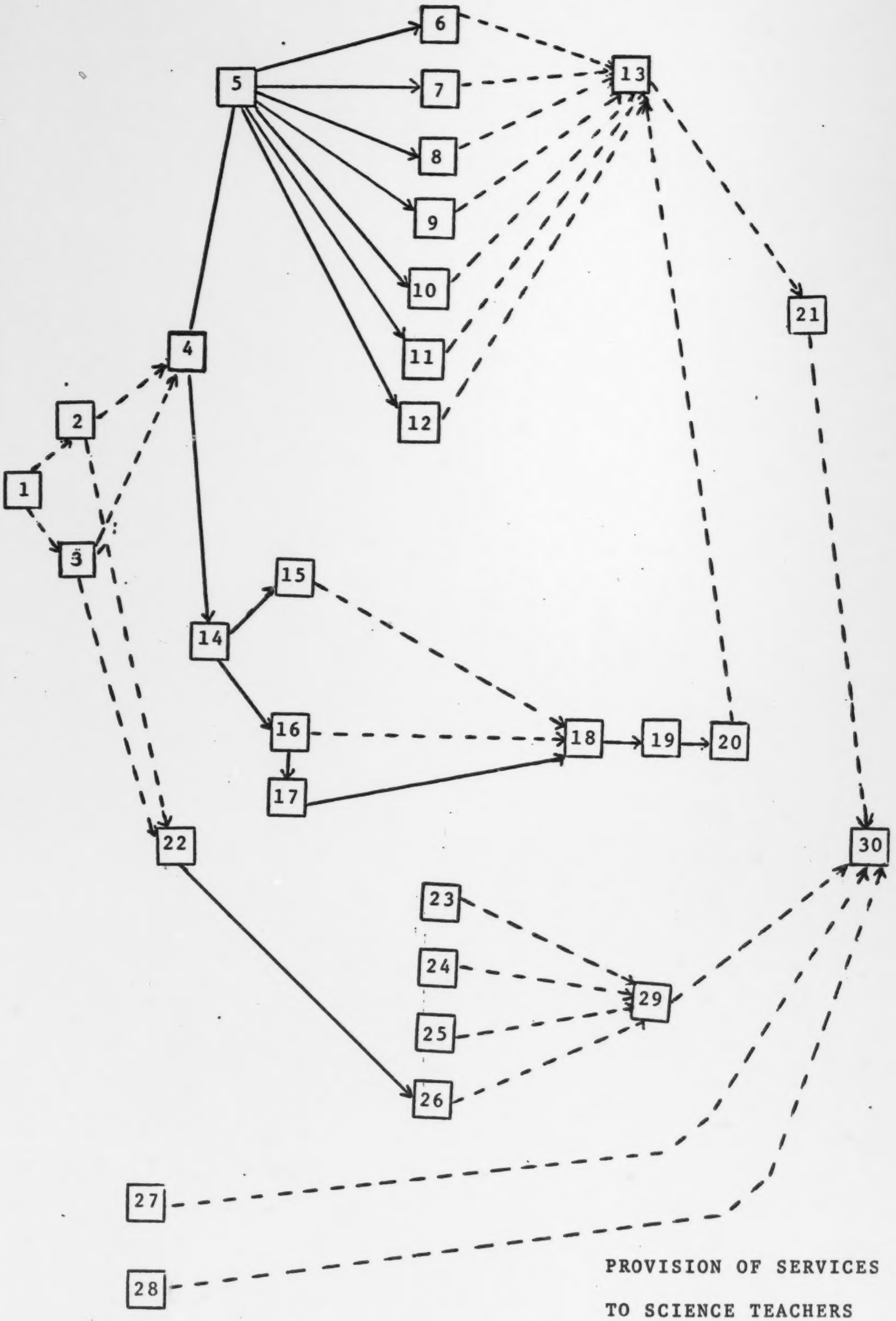
REPORTS

MODEL 2: PROVISION OF SERVICES TO SCIENCE TEACHERS

Model Sequential Order	Model Checkpoint	Capital Letter of Management Game
1.	Begin: Services to Science Teachers	
2.	Daily Diary	AK
3.	Anecdotal Records	AW
4.	Begin: Regular Communication with Staff	CF
5.	Begin: Monthly Staff Meeting	AC
6.	Plan for Science Competition	T
7.	Parents Day Plans	BR & BT
8.	Remedial Action Plans	CH
9.	Complaints from Parents &/or PTA	BH
10.	Requests from Administration	AI
11.	Public Relations Feedback	BG
12.	Application of Validated Learning Systems & Mediated Material	CG
13.	End: Monthly Staff Meetings	AC
14.	Begin: Journal Clubs	BO
15-20.	Research Review	H
21.	End: Regular Communication with Staff	
22.	Begin: Individual Conferences & Counseling Sessions	AQ
23.	Discussion of Individual's Strengths & Weaknesses	
24.	Consideration of Physical & Mental Health of Individual	AJ

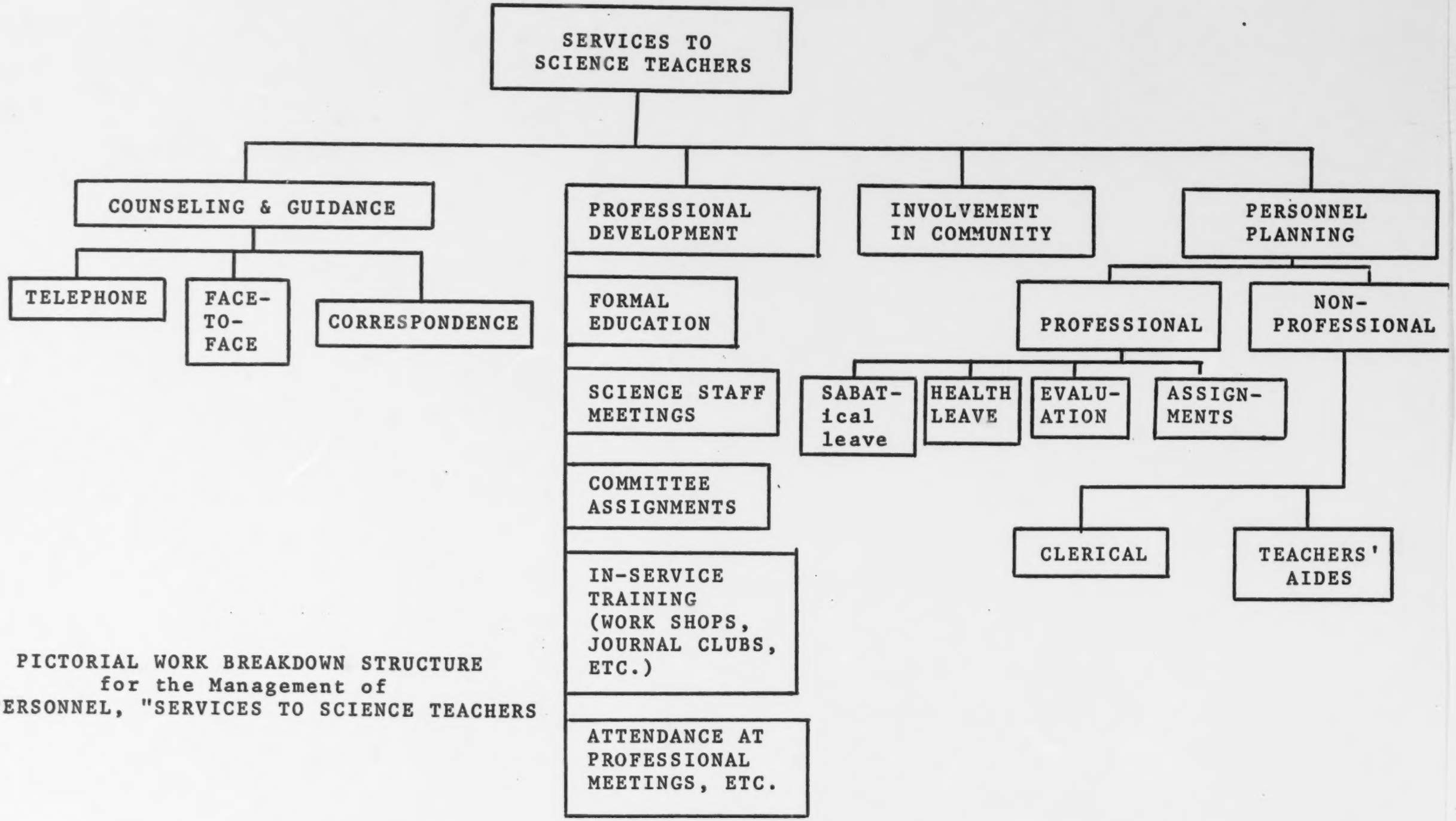
MODEL 2: PROVISION OF SERVICES TO SCIENCE TEACHERS CONT'D

Model Sequential Order	Model Checkpoints	Capital Letter of Management Game
25.	Complaints & Suggestions of Teachers	BN
26.	Problem-Solving	
27.	Memoranda & Letters	S
28.	Telephone Conferences	AF
29.	End: Individual Conferences & Counseling	AQ
30.	End: Services to Science Teachers	



PROVISION OF SERVICES

TO SCIENCE TEACHERS



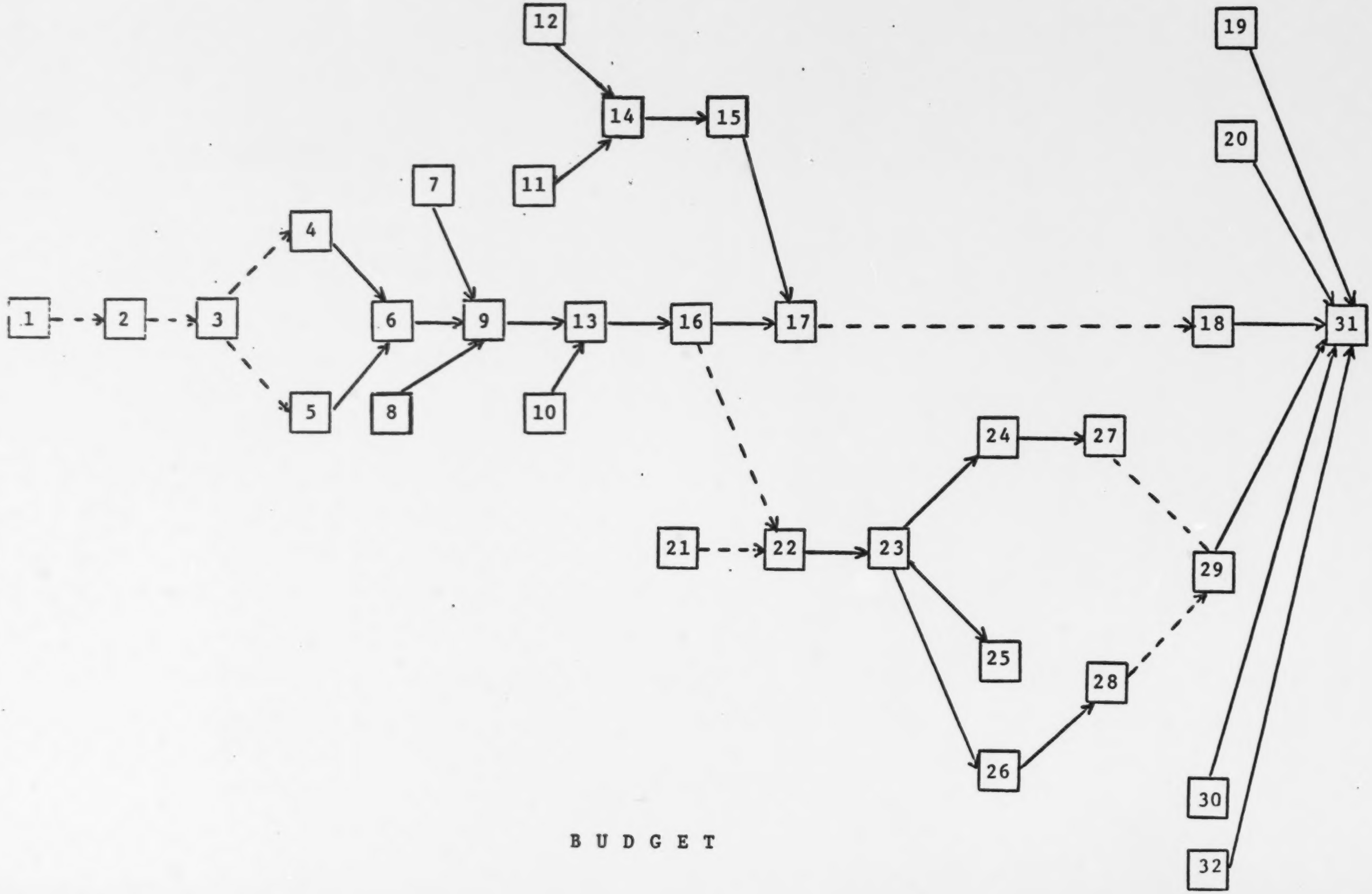
PICTORIAL WORK BREAKDOWN STRUCTURE
for the Management of
PERSONNEL, "SERVICES TO SCIENCE TEACHERS

MODEL 3: BUDGET

Model Sequential Order	Model Checkpoints	Capital Letter of Management Game
1.	Begin: Budget	I
2.	Begin: Staff	
3.	Begin: Regular Staff Available	
4.	Staff on Health Leave	
5.	Staff on Sabbatical Leave	
6.	Total Staff on Leave	
7.	Staff Retirement	
8.	Staff Transfer to Other School	
9.	End: Regular Staff Available	
10.	Applications	BK
11.	Teacher Aides	CD
12.	Clerical Support	A
13.	Potential Staff Evaluation	AV
14.	Possible Job Assignments	
15.	Job Vacancies	AY
16.	Staff Selection	CE
17.	Job Assignments	AT
18.	End: Staff	
19.	End: EMS	
20.	End: Services to Science Teachers	

MODEL 3: BUDGET CONT'D

Model Sequential Order	Model Checkpoint	Capital Letter of Management Game
21.	Begin: Professional Development	AU
22.	Guidance (Conference or Counseling Sessions)	AQ
23.	Developmental Assignments	
24.	Begin: Continuing Education	BY
25.	Committee Assignments	AX
26.	Action Research	AR
27.	End: Continuing Education	
28.	In-Service Training	AP
29.	End: Professional Development	
30.	End: Reports	
31.	End: Budgetary Allocations	
32.	Optimum Learning System (Management Goal 4)	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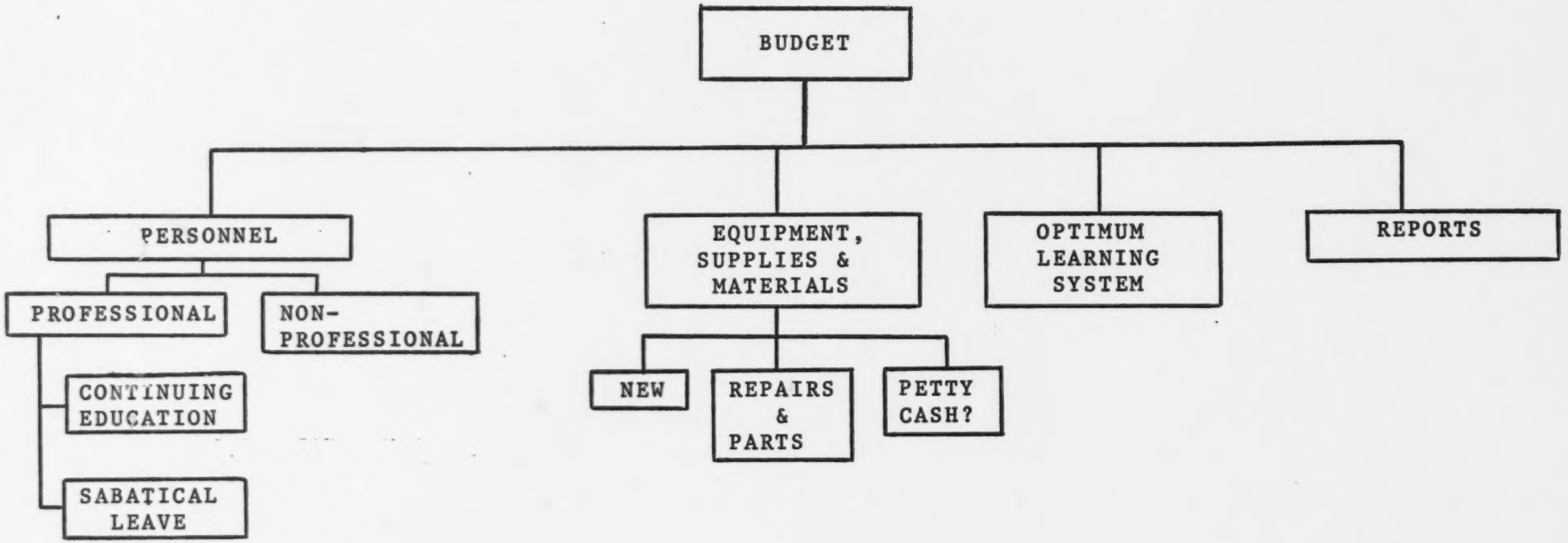
B U D G E T



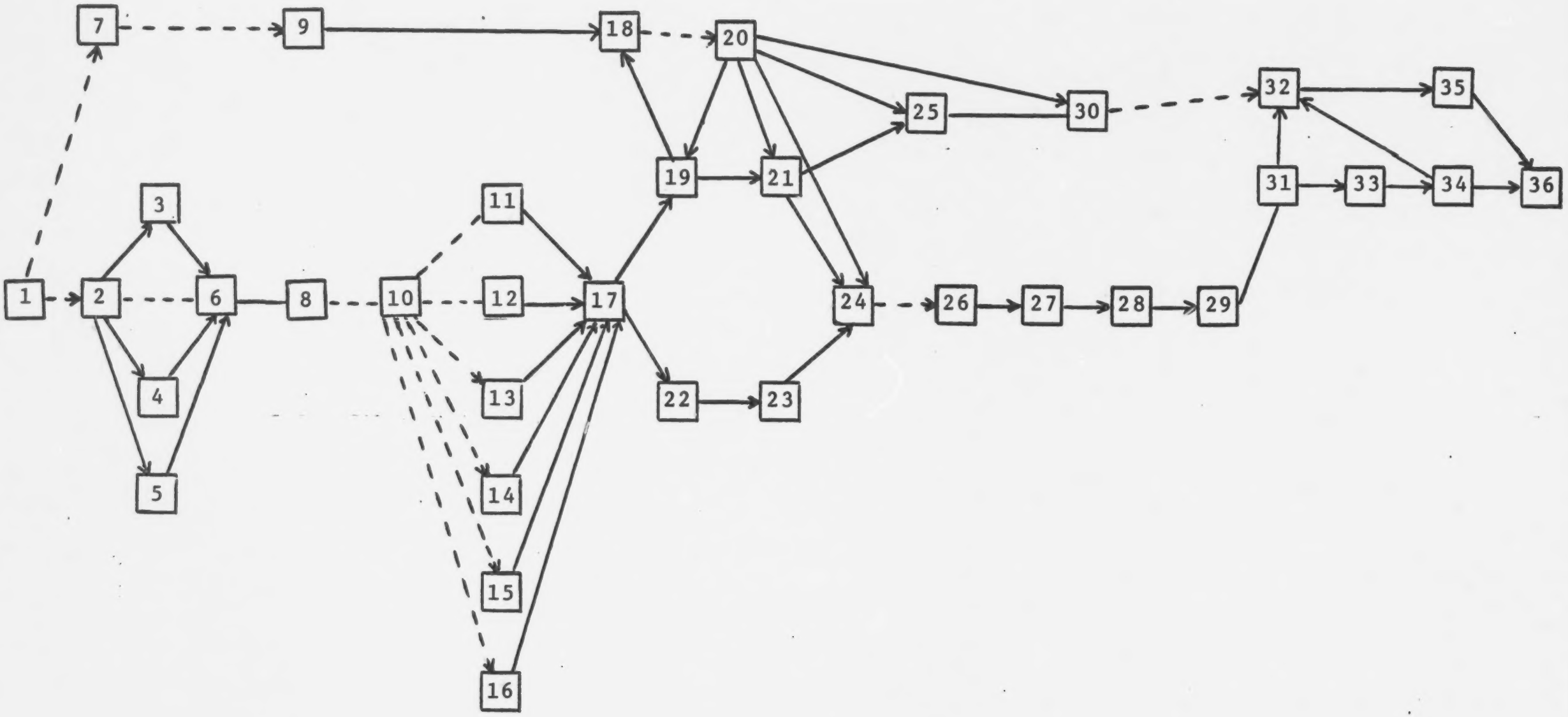
PICTORIAL WORK BREAKDOWN STRUCTURE
for the Management of
BUDGET

MODEL 4: OPTIMUM LEARNING SYSTEM

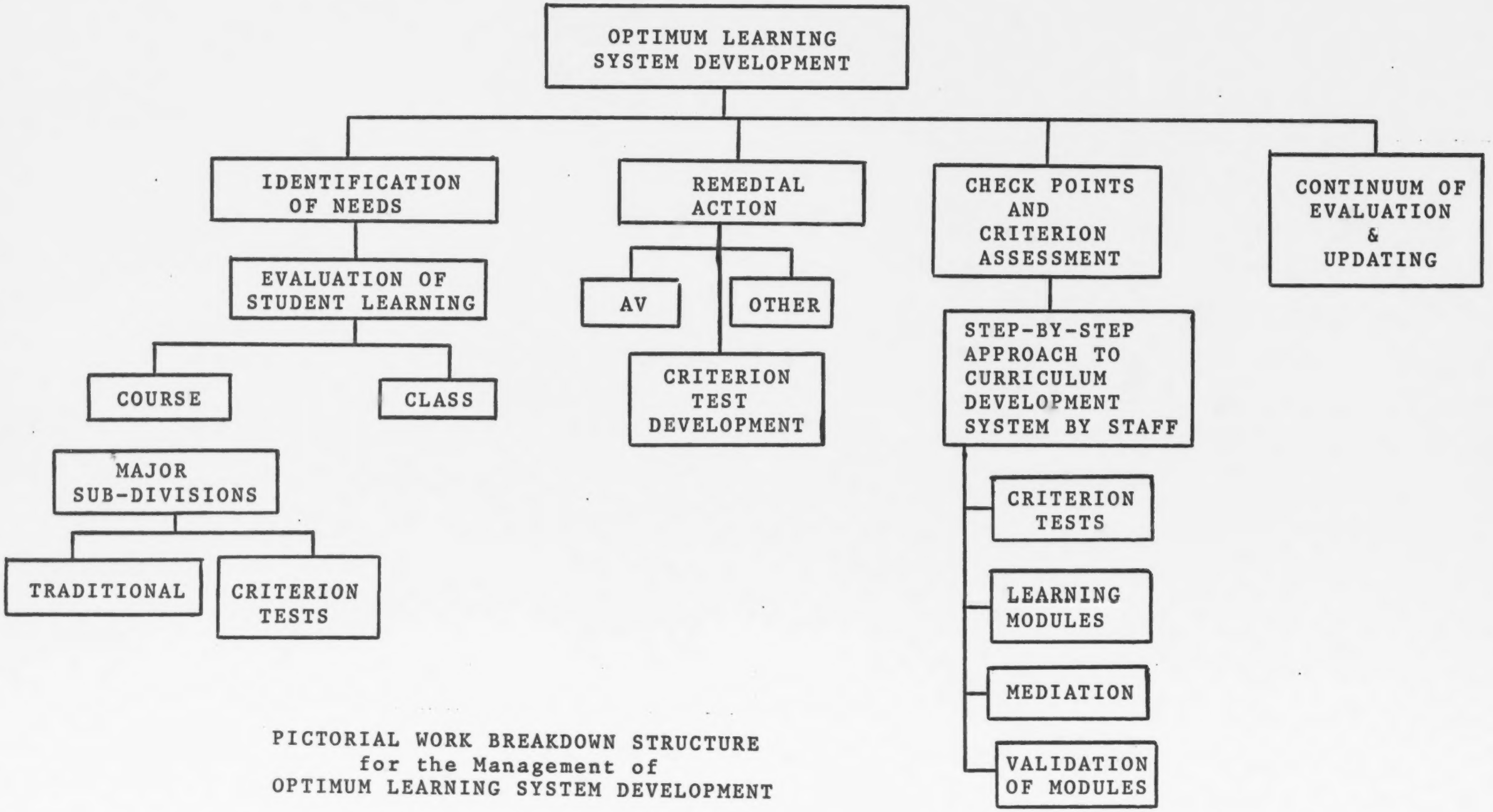
Model Sequential Order	Model Checkpoint	Capital Letter of Management Game
1.	Begin: Development of Optimum Learning System	
2.	Begin: Evaluation of Present System	AB
3.	Per Cent of College Prep Students into College	BL
4.	Per Cent of Students into Technical Training	AO
5.	Per Cent of Students into Work Force	BM
6.	End: Evaluation of Present System	
7.	Begin: Evaluation of Staff	AV
8.	Begin: Course Evaluation	
9.	Begin: Class Evaluation	
10.	Begin: Analysis of Major Parts	
11.	Begin: Course A	
12.	Begin: Course B	
13.	Begin: Course C	
14.	Begin: Course D	
15.	Begin: Course E	
16.	Begin: Course F	
17.	List of Major Parts	
18.	Traditional Staff Evaluation	AV
19.	Traditional Evaluation of Each Part	
20.	Staff Involvement	J

MODEL 4: OPTIMUM LEARNING SYSTEM CONT'D

Model Sequential Order	Model Checkpoint	Capital Letter of Management Game
21	Audio Visual Remedial Action	CH
22.	Criterion Assessment for Each Part	
23.	Application of Criterion Assessment to On-Going Courses	
24.	Comparison of Traditional Evaluation with Criterion Assessment Results	
25.	Equipment, Materials & Supplies	CB
26.	Begin: Preparation of Learning Modules	
27.	Validation of Learning Modules	
28.	Mediation	
29.	Validation of Mediated Materials	
30.	Continuous Evaluation	
31.	Introduction of New Learning Modules	CG
32.	Evaluation & Comparison with Previous Evaluation	CM
33.	Learning System Development	AH
34.	Application of New Learning System	BP
35.	Modification or Improvement of New Learning System	
36.	Optimum Feasible Learning System	



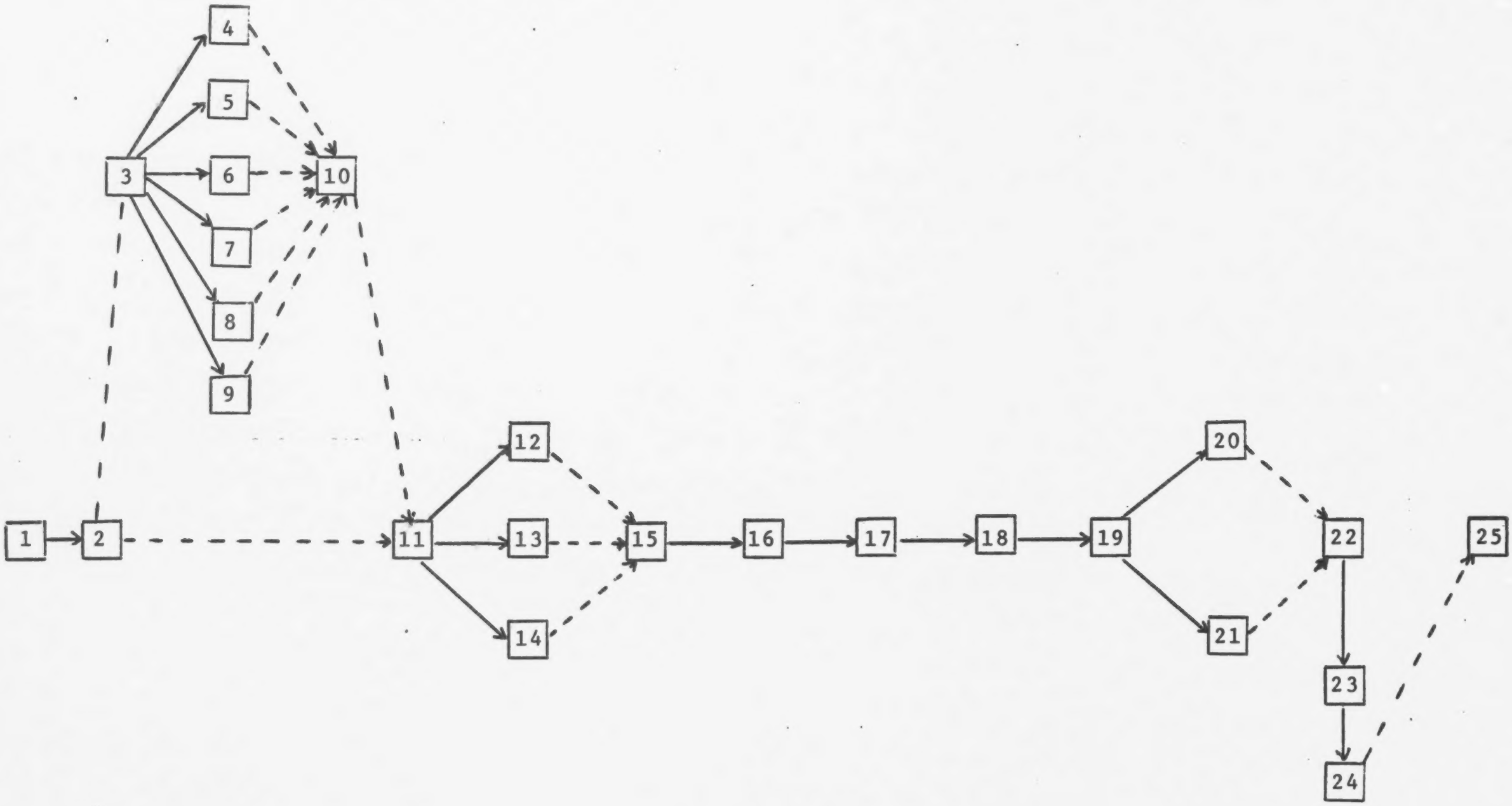
OPTIMUM LEARNING SYSTEM



PICTORIAL WORK BREAKDOWN STRUCTURE
for the Management of
OPTIMUM LEARNING SYSTEM DEVELOPMENT

MODEL 5: EQUIPMENT, SUPPLIES & MATERIALS

Model Sequential Order	Model Checkpoint	Capital Letter of Management Game
1.	Q. & Q. Student Learning	AB
2.	Determination of Needs	G
3.	Begin: Knowledge of ESM	
4.	Visiting Exhibits	AA
5.	Talking to Salesmen	W
6.	Visiting Other Districts (or States)	X
7.	Suggestions of Faculty Members	BN
8.	Perusing Catalogues	U
9.	Professional Organizations & Journals	CI
10.	End: Knowledge of ESM	
11.	Begin: Budgetary Allocations	
12.	Available Storage Space	CJ
13.	Available Utilization Space	CK
14.	Available Utilities	
15.	End: Budgetary Allocations	
16.	Standards	
17.	Proposals	CL
18.	Orders	Q
19.	Deliveries	Z
20.	Maintenance Schedule	P
21.	Replacement Parts	F
22.	Inventories	B
23.	Distribution & Reporting Procedures	C
24.	Staff Orientation	M

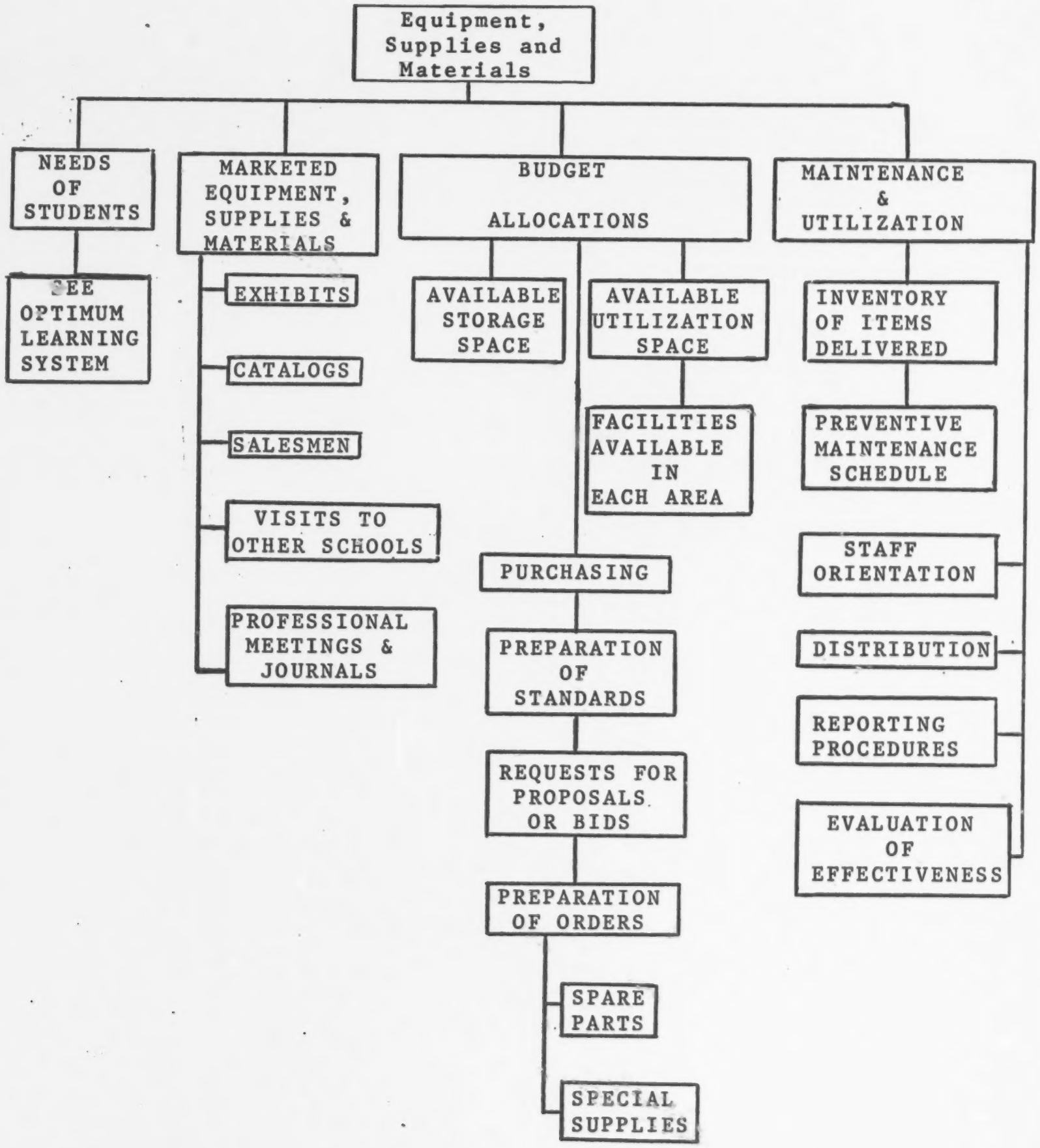


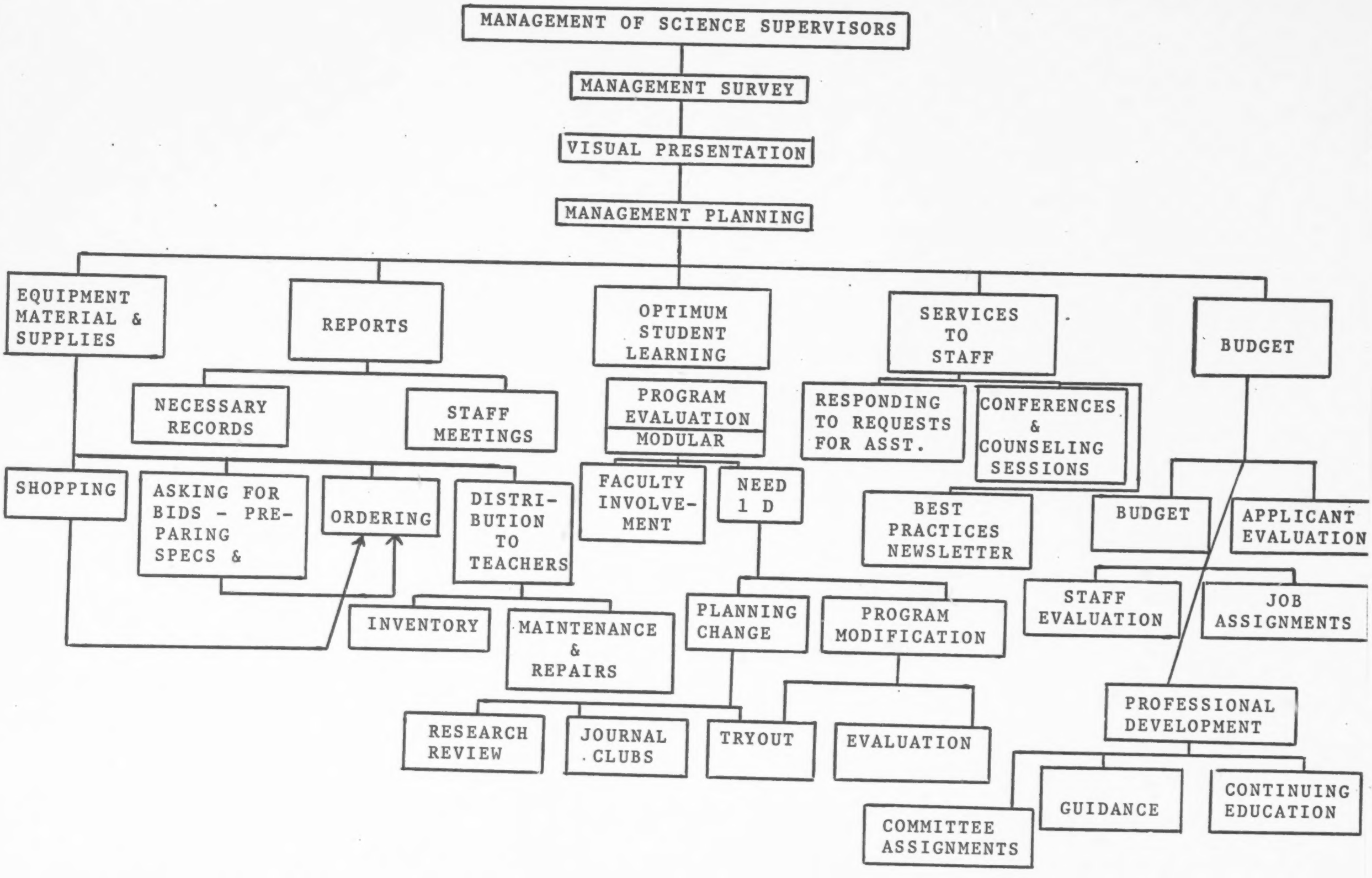
EQUIPMENT, MATERIALS & SUPPLIES

PICTORIAL WORK BREAKDOWN STRUCTURE

for the Management of

EQUIPMENT, SUPPLIES, & MATERIALS




MANAGEMENT OF SCIENCE SUPERVISORS
MANAGEMENT SURVEY
VISUAL PRESENTATION
MANAGEMENT PLANNING
EQUIPMENT MATERIAL & SUPPLIES
REPORTS
OPTIMUM STUDENT LEARNING
SERVICES TO STAFF
BUDGET
NECESSARY RECORDS
STAFF MEETINGS
PROGRAM EVALUATION
MODULAR
RESPONDING TO REQUESTS FOR ASST.
CONFERENCES & COUNSELING SESSIONS
SHOPPING
ASKING FOR BIDS - PRE-PARING SPECS &
ORDERING
DISTRI-BUTION TO TEACHERS
FACULTY INVOLVE-MENT
NEED 1 D
BEST PRACTICES NEWSLETTER
BUDGET
APPLICANT EVALUATION
INVENTORY
MAINTENANCE & REPAIRS
PLANNING CHANGE
PROGRAM MODIFICATION
STAFF EVALUATION
JOB ASSIGNMENTS
RESEARCH REVIEW
JOURNAL CLUBS
TRYOUT
EVALUATION
PROFESSIONAL DEVELOPMENT
COMMITTEE ASSIGNMENTS
GUIDANCE
CONTINUING EDUCATION

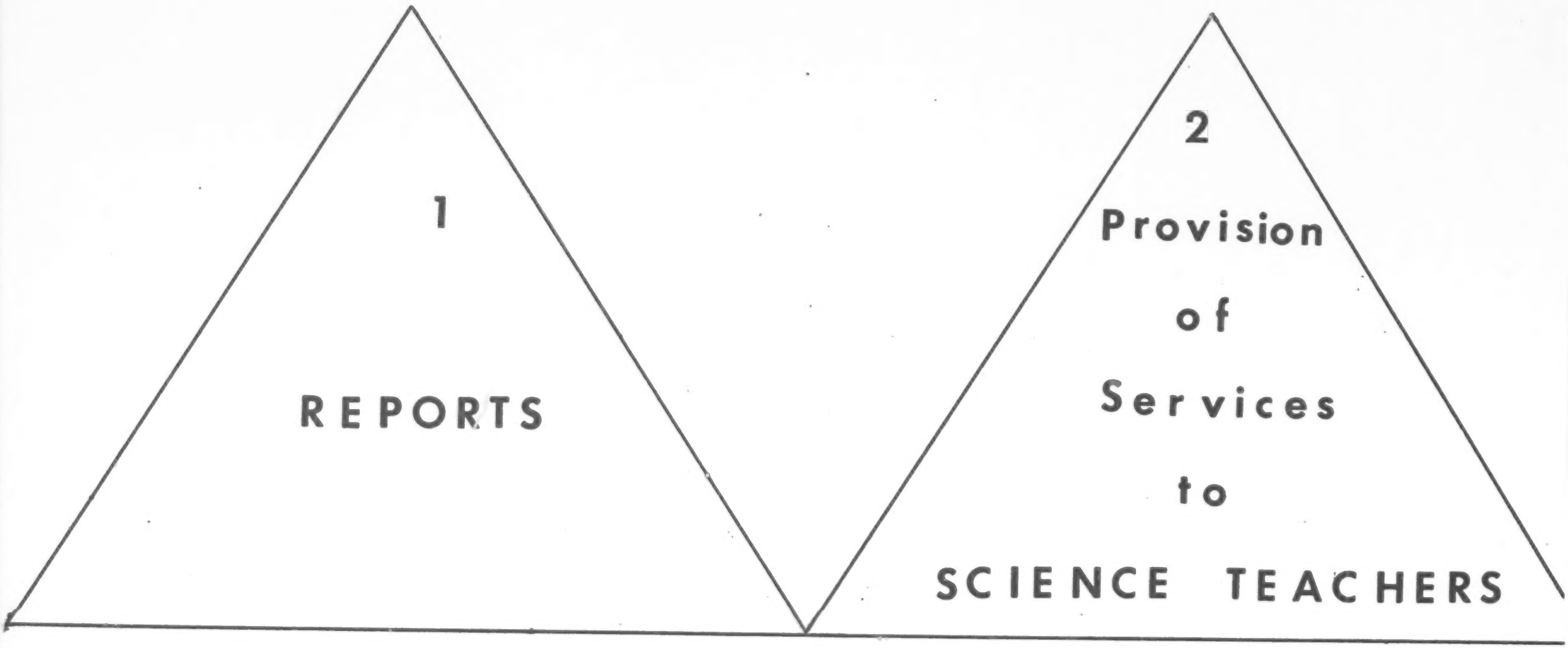
A P P E N D I X E

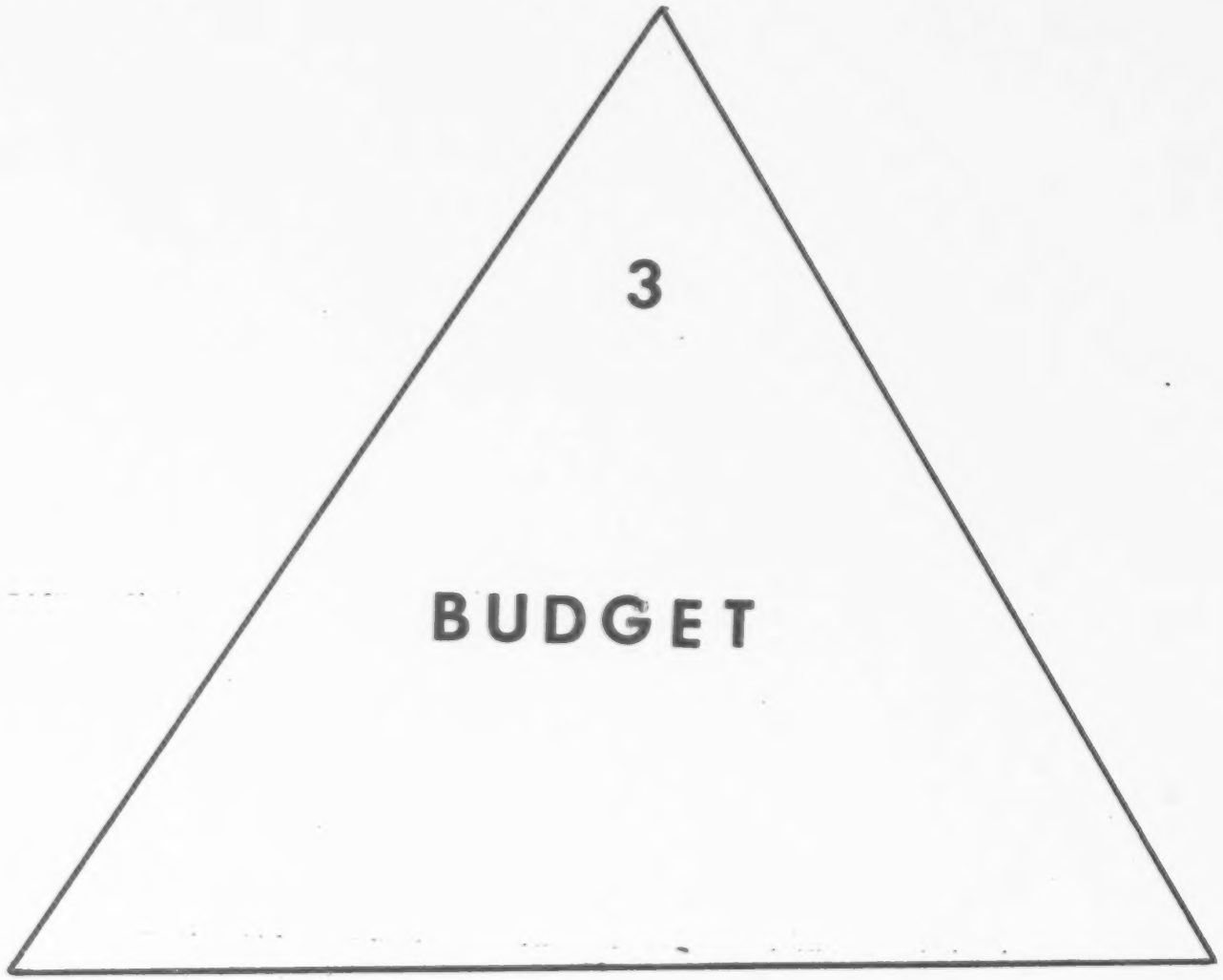
PROJECT MATERIALS

TERMINAL GOALS

CHECKPOINTS

TEMPLATE


1
REPORTS
2
Provision
of
Services
to
SCIENCE TEACHERS


3
BUDGET

4

OPTIMUM

LEARNING SYSTEM

5

Equipment

Supplies

Materials

A	B	C	D
CLERICAL SUPPORT 1. 2. 3. 4. 5.	INVENTORY 1. 2. 3. 4. 5.	DISTRIBUTION TO TEACHERS 1. 2. 3. 4. 5.	PROCUREMENT OF BIDS 1. 2. 3. 4. 5.

E	F	G	H
IDENTIFICATION OF UNMET NEEDS 1. 2. 3. 4. 5.	REPAIRS & REPLACEMENTS 1. 2. 3. 4. 5.	DETERMINATION OF NEEDS 1. 2. 3. 4. 5.	RESEARCH REVIEW 1. 2. 3. 4. 5.

I

BUDGET

1. 2. 3.

4. 5.

J

INVOLVEMENT

OF FACULTY

1. 2. 3.

4. 5.

K

COMPARISON OF

NEEDS TO BUDGET

1. 2. 3.

4. 5.

L

ASSIGNMENT OF

PRIORITIES

1. 2. 3.

4. 5.

M

RECEIVING

INSTRUCTIONS

1. 2. 3.

5.

N

REQUESTS FOR

ASSISTANCE

1. 2. 3.

4. 5.

O

ADMINISTRATIVE

BRIEFING

1. 2. 3.

4. 5.

P

MAINTENANCE

1. 2. 3.

4. 5.

Q

ORDERING

1. 2. 3.

4. 5.

R

DISCUSSION

OF BUDGET

1. 2. 3.

4. 5.

S

MEMORANDA

& LETTERS

1. 2. 3.

4. 5.

T

COMPETITIVE TEAM

IN STATE CASH

AWARDS USED

FOR EQUIPMENT

1. 2. 3.

4. 5.

U

PERUSING CATALOGS

1. 2. 3.

4. 5.

V

VISITS TO

SCIENCE CLASSROOMS

1. 2. 3.

4. 5.

W

TALKING TO

SALESMEN

1. 2. 3.

4. 5.

X

VISITING

OTHER DISTRICTS

(OR STATES)

1. 2. 3.

4. 5.

Y

"SHARING"

LIMITED

EQUIPMENT

1. 2. 3.

4. 5.

Z

CHECKING

DELIVERIES

1. 2. 3.

4. 5.

AA

VISITING

EXHIBITS

1. 2. 3.

4. 5.

AB

EVALUATION OF

STUDENT LEARNING

(QUANTITATIVE

& QUALITATIVE)

1. 2. 3.

4. 5.

AC

MEETINGS

1. 2. 3.

4. 5.

AD

TESTING &

VALIDATION

1. 2. 3.

4. 5.

AE

STATISTICAL

SUMMARIES

1. 2. 3.

4. 5.

AF

TELEPHONE

CONFERENCES

1. 2. 3.

4. 5.

AG

SUGGESTIONS

FROM

ADMINISTRATORS

1. 2. 3.

4. 5.

AH

BASIC LEARNING

PROGRAM DEVELOPMENT

1. 2. 3.

4. 5.

AI

REQUESTS FROM

ADMINISTRATORS

1. 2. 3.

4. 5.

AJ

HUMAN REPAIR

& MAINTENANCE

1. 2. 3.

4. 5.

AK

DAILY DIARY

1. 2. 3.

4. 5.

AL

PROGRESS REPORT

1. 2. 3.

4. 5.

AM

EXPLANATION

OF WRITTEN

REPORTS, ETC.

1. 2. 3.

4. 5.

AN

ORIENTATION

OF

NEW FACULTY

1. 2. 3.

4. 5.

AO

PREPARATION FOR

VOCATIONAL TRAINING

1. 2. 3.

4. 5.

AP

IN-SERVICE

TRAINING

1. 2. 3.

4. 5.

AQ

CONFERENCES OR

COUNSELING SESSIONS

1. 2. 3.

4. 5.

AR

ACTION RESEARCH

1. 2. 3.

4. 5.

AS

PLANNING

FUTURE

PROGRAMS

1. 2. 3.

4. 5.

AT

JOB ASSIGNMENTS

1. 2. 3.

4. 5.

AU

PROFESSIONAL

DEVELOPMENT

1. 2. 3.

4. 5.

AV

STAFF EVALUATION

1. 2. 3.

4. 5.

AW

ANECDOTAL RECORDS

1. 2. 3.

4. 5.

AX

COMMITTEE

ASSIGNMENTS

1. 2. 3.

4. 5.

AY

JOB VACANCIES

1. 2. 3.

4. 5.

AZ

ORAL INTERVIEWS

1. 2. 3.

4. 5.

BA

INTERIM REPORTS

1. 2. 3.

4. 5.

BB

ANNUAL REPORTS

1. 2.

4. 5.

BC

CONVENTIONS,

INSTITUTES

& WORKSHOPS

1. 2. 3.

4. 5.

BD

TEACHER DESIRES

1. 2. 3.

4. 5.

BE

TEACHER ABILITIES

1. 2. 3.

4. 5.

BF

GRADUATE STUDIES

1. 2. 3.

4. 5.

BG

PUBLIC

RELATIONS

FEEDBACK

1. 2. 3.

4. 5.

BH

P.T.A. OR

PARENT

COMPLAINTS

1. 2. 3.

4. 5.

BI

UNSATISFACTORY OR

QUESTIONABLE EVALUATION

OF STUDENT LEARNING

1. 2. 3.

4. 5.

BJ

TEACHING

RESPONSIBILITIES

1. 2. 3.

4. 5.

BK

APPLICATION

EVALUATION

1. 2. 3.

4. 5.

BL

GETTING KIDS

INTO COLLEGE

1. 2. 3.

4. 5.

BM

TRADE MASTERY

1. 2. 3.
4. 5.

BN

SUGGESTIONS OF
FACULTY MEMBERS

1. 2. 3.
4. 5.

BO

JOURNAL CLUBS

1. 2. 3.
4. 5.

BP

IMPLEMENTATION
OF
LEARNING SYSTEMS

1. 2. 3.
4. 5.

BQ

STUDENT GUIDANCE

1. 2. 3.
4. 5.

BR

INVOLVEMENT
OF PARENTS

1. 2. 3.
4. 5.

BS

SUGGESTIONS
OF STUDENTS

1. 2. 3.
4. 5.

BT

SUGGESTIONS
OF PARENTS

1. 2. 3.
4. 5.

BU

DETERMINATION OF

WHAT WE WANT

STUDENTS TO LEARN

1. 2. 3.

4. 5.

BV

INVOLVEMENT

OF STUDENTS

1. 2. 3.

4. 5.

BW

NO APPLICATION

OF APPROVED &

VALIDATED SYSTEM

OR MEDIATED MATERIALS

1. 2. 3.

4. 5.

BX

BEST PRACTICES

NEWS LETTER

1. 2. 3.

4. 5.

BY

CONTINUING

EDUCATION

1. 2. 3.

4. 5.

BZ

SUGGESTIONS

OF

COMMUNITY

1. 2. 3.

4. 5.

CA

PRESENTATIONS TO

COMMUNITY GROUPS

1. 2. 3.

4. 5.

CB

EQUIPMENT,

MATERIAL,

&

SUPPLIES

1. 2. 3.

4. 5.

CC

PERSONNEL

REPORTS

1. 2. 3.

4. 5.

CD

STAFF

SELECTION

1. 2. 3.

4. 5.

CE

TEACHER AIDES

1. 2. 3.

4. 5.

CF

STAFF

COMMUNICATIONS

1. 2. 3.

4. 5.

CG

APPLICATION OF

VALIDATED LEARNING

SYSTEMS &

MEDIATED MATERIALS

1. 2. 3.

4. 5.

CH

REMEDIAL PLANS

1. 2. 3.

4. 5.

CI

EQUIPMENT SPACE

1. 2. 3.

4. 5.

CJ

PROFESSIONAL

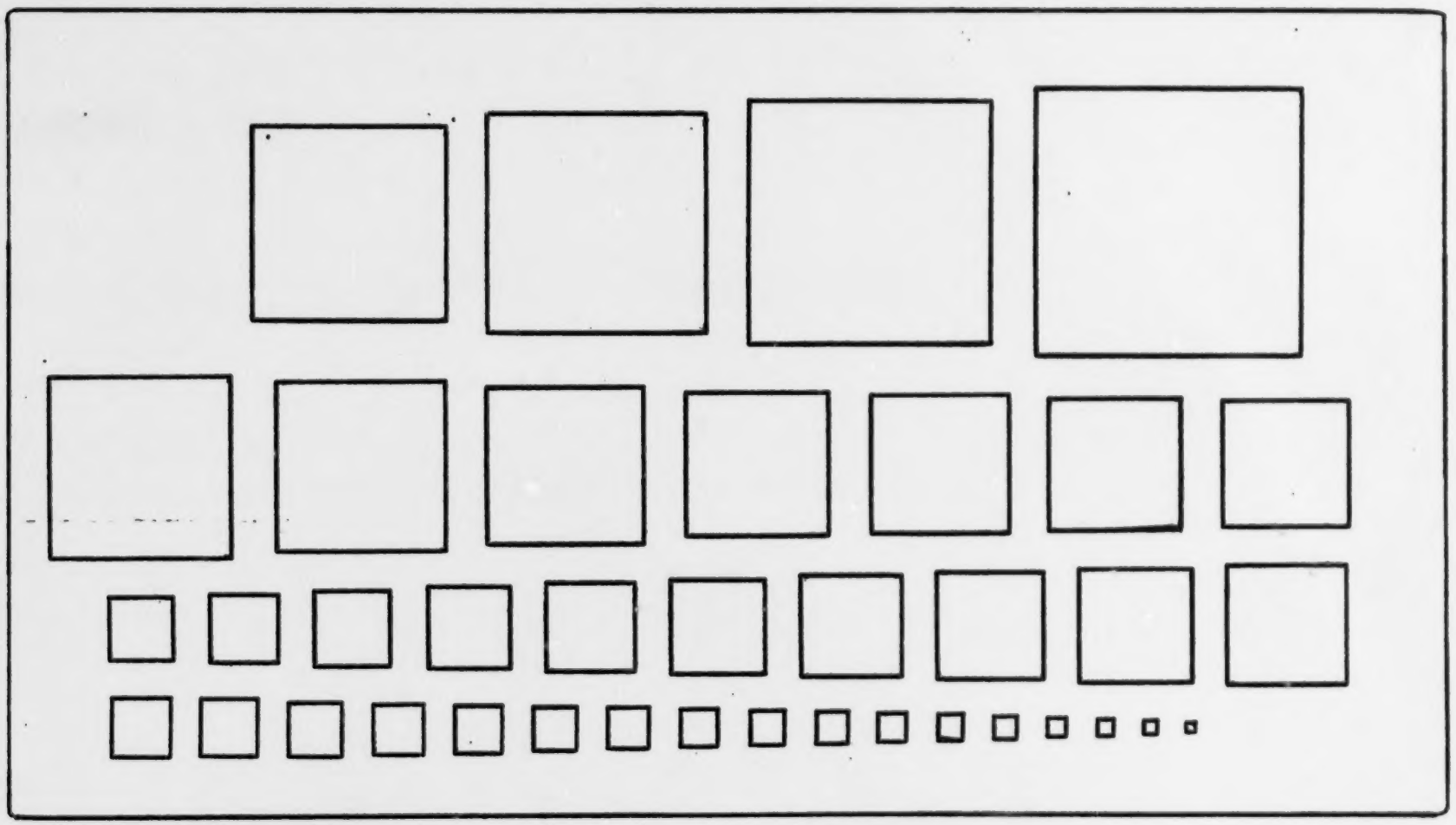
ASSOCIATIONS

& JOURNALS

1. 2. 3.

4. 5.

CK EQUIPMENT UTILIZATION 1. 2. 3. 4. 5.	CL PROPOSAL PREPARATION 1. 2. 3. 4. 5.	CM VALIDATION OF NEW LEARNING MATERIAL 1. 2. 3. 4. 5.	20 BLANK SQUARES



SQUARE TEMPLATE

EDUCATIONAL TECHNOLOGY PROJECT

criterion assessments

These assessments have been developed as a self evaluative activity for supervisors. The questions are based on the model systems used in Unit III. They are presently designed as a follow-up activity after the kit has been completed. As such, they serve to provide a more open-ended conclusion. However, all supervisors who have gone through the kit during group validations have received them.

NATIONAL SCIENCE TEACHERS ASSOCIATION
1201 Sixteenth St., N.W., Washington, D.C. 20036

CRITERION ASSESSMENT - REPORTS

2. What clerical support do you have?

2.1 None.

2.1.1 Write longhand.

2.1.2 Do my own typing.

2.2 Typist available _____hours per week.

2.3 Stenographer available _____hours per week.

2.4 Other: (dictating machine, etc.. _____

_____.

3. Do you keep a daily diary or some other type of daily record? _____. If you do, send us a copy of the entries for one week of school. If you don't, start keeping one and send us a copy of the entries made during the first week.

4. Do you maintain a file of anecdotal records? _____. Send us copies of one or two of them. If you don't, prepare one or two to send us.

6. Do you have regularly scheduled meeting with your science teachers as a group?

6.1 How many attend?

6.2 How frequent are the meetings?

7. Journal Clubs and Committees.

7.1 If "Yes":

7.1.1 Do science major students attend in addition to the science teachers?

7. Continued.

7.1.3 What scientific journals are reviewed?

7.1.4 Are the reviews or excerpts published for distribution?

7.1.4.1 If "Yes", how many copies? _____.

7.1.4.2 If "No", do you plan to start?

7.2 Do you have any committees on which you or members of your staff participate?

7.2.1 If "Yes", please list them:

7.3 Attach pertinent materials relating to these meetings, such as:

7.3.1 Agenda.

7.3.2 Minutes.

7.3.3 Reports.

7.3.4 Other.

8. Do you routinely communicate with your science teachers by telephone?

8.1 About how much time each day?

8.2 About how much time each week?

CRITERION ASSESSMENT - REPORTS

9. Give us an estimate of the amount of correspondence involved in you job.

   9.1 About _____ letters per week.

11. List type of materials included in your personnel files on science teachers.

12. Prepare a realistic budget for this unit on reports including the following items as a minimum:

   12.1 Clerical hours.

   12.2 Professional hours (you and your staff)

   12.3 Equipment, supplies, & materials:

      12.3.1 Typewriter(s).

      12.3.2 File cabinets.

      12.3.3 Postage.

      12.3.4 Telephone.

      12.3.5 Miscellaneous (Itemize)

15. Reports to Community through various methods.

   15.1 Send us copies of presentations you have made to community groups or prepare a presentation to be made to a community group.

      15.1.1 Describe the method(s) used to involve attendees.

      15.1.2 List equipment (including media) used.

CRITERION ASSESSMENT - REPORTS

15. Continued.

15.1.3 List and describe student involvement.

15.2 Did you ever use equipment desired for use in school in your presentations?

15.2.1 Did you borrow it from a dealer or a supply house?

15.2.2 Did you borrow it from another school?

15.2.3 If obtained otherwise, describe.

15.3 Do you have a community newsletter?

Presentations to Parents.

15.4 Do you have any planned presentations to parents such as:

15.4.1 Back to school nights?

15.4.2 Election Day visitations?

15.4.3 Others? (List and describe briefly)

15.4.4 Do you have a newsletter to parents?

If you do, attach a copy of the most recent one.

15.4.5 How is student learning reported to the parents?

CRITERION ASSESSMENT - REPORTS

15. Continued.

15.4.5.1 Report Cards.

15.4.5.2 Conferences.

15.4.5.3 Others. (List and describe)

17. How many statistical reports do you submit each school year? _____ (Describe and submit a copy of each)

18. Requests from Administration.

18.1 Do you have special presentation(s) for School Board and Administration? _____. Describe briefly.

18.2 Do your students participate in formal competition such as a state science league?

18.2.1 If they do, list and give standing and points received.

18.2.2 Are there competitive events available in which your students do not participate? _____. If so, please describe.

CRITERION ASSESSMENT - REPORTS

18. Continued.

18.2.3 Are there opportunities for students to participate in scientific programs sponsored by industry, etc.? _____. If so, please describe.

18.3 Working with your staff, identify some unique needs of science which might be used in presentations. Prepare a list of these.

19. What reports are you required to keep by the state, district, county, or school? List these and indicate the approximate amount of time required for the presentation of each.

CkITERION ASSESSMENT - SERVICES TO SCIENCE TEACHERS

22. Guidance

22.1 Do you have a file on each of the science teachers under your supervision?

22.1.1 Check any of the following materials you maintain in these files:

22.1.1.1 Basic personnel data _____

22.1.1.2 Anecdotal records _____

22.1.1.3 Traditional evaluation _____

Describe _____

_____

22.1.1.4 Teaching assignments _____

22.1.1.5 Community activities _____

22.1.1.6 Education _____

22.1.2 List other materials you include in these files.

22.2 Do you have regular counseling sessions or conferences with each of your science teachers?

22.2.1 If you do, how are these scheduled? (Describe in 25 words or less)

22.2.2 If you do not, would it be a good idea to try this?

23. Developmental Assignments

23.1 Do you take into consideration developmental opportunities for individual teachers when making assignments or do you select the one you believe can do the best job?

23.2 If you have a list of developmental assignments, send us a copy.

23.3 If you don't have such a list, prepare one.

24. Continuing Education

24.1 Is there some form of education assistance available to you and your science teachers for formal education? Describe.

24.2 Have you used committee assignments as a form of in-service training? Describe.

24.3 Are your science teachers involved in any action research at the present time?

CRITERION ASSESSMENT - SERVICES TO SCIENCE TEACHERS

24.4 Do you have a science journal club in operation?

24.4.1 If you do, answer the following questions:

24.4.1.1 Do any students participate?

24.4.1.2 What journals are covered?

_____

_____

_____

24.4.1.3 How often does the club meet?

24.4.1.4 How many copies of the reviews are distributed?

24.4.2 Do you plan to start one?

29. Have you ever discussed the need for guidance and other developmental activities with your science teachers?

CRITERION ASSESSMENT - BUDGET

2. Budget

2.1 List names of those on regular staff this year in alphabetical order.

2.1.1 Using a green pencil or pen, put an "H" in front of those known to be on health leave, and an "S" in front of those on sabbatical leave.

2.1.2 Using a red pencil or pen, put an "R" in front of those being retired, and a "T" in front of those being transferred out of your area of supervision.

9. List the names of those available this year from last year's staff, in alphabetical order, add the salary of each in a column to the right.

10. Review and assess applicants for positions for the coming year.

13. To the list prepared in 9, add your evaluation of each, using A, B, and C subjectively.

14. List each science class to be taught this year, beginning with the most advanced classes.

14.1 Tentatively assign members of the regular staff to these classes.

CRITERION ASSESSMENT - BUDGET

14. Continued

14.1.1 Consider the use of teacher aides and/or clerical support to make it possible to increase class hours for the more able teacher(s).

14.1.2 Discuss this possibility with the teacher(s) involved.

14.2 Prepare a list of the number of teacher aides and/or clerks desired.

14.2.1 Write a justification for each position, using information obtained in 14.1.

14.2.2 Have the teacher(s) involved comment on and approve the justification(s).

15. Job Vacancies

15.1 Using information obtained in 14, prepare a list of job vacancies indicating salary for each in column to the right.

Teachers.

Teacher Aides.

Clerks.

15.2 Prepare a list of job vacancies for teachers only, if no teacher aides or clerks are employed.

15.3 Compare the budget for 15.1 with the budget for 15.2.

15.4 Write a memorandum to your administrator with your recommendations for staffing next year, using the information from 14.2 and 15.3 as part of your justification.

CRITERION ASSESSMENT - BUDGET

16.1 When job vacancies have been firmly established (approved by your administration) prepare a list of staff members selected for next year: teachers, teacher aides, clerks.

16.1.1 Check availability of those selected.

16.1.2 Complete employment procedures.

17. Make job assignments.

18. Record total budget for personnel salaries.

19. Record total budget for equipment, supplies & materials.

29. Record total budget for professional development.

30. Record total budget for reports.

31. Record total budget for optimum learning system development.

32. Total items 18, 19, 29, 30, and 31 for total budget.

CRITERION ASSESSMENT - OPTIMUM LEARNING SYSTEM

3.1 How many college preparatory students did you have last year?

3.2 How many of the above students were majoring in science?

3.3 Using the following chart, indicate how many of your students took science on the examinations and how many passed or failed?

EXAMINATION	TOTAL	PASSED	FAILED
College Entrance			
Regents			
Other (Not Local)			

3.4 How many of your students desirous of being admitted to college were accepted?

a. Successful? _____

b. Unsuccessful _____

4.1 How many of your senior students aspired to enter technical training institutions?

4.2 How many of your senior students were accepted into technical training institutions?

5.1 How many of your graduates joined the work force after graduation? (Do not include temporary or summer employment)

a. Total _____

b. As Technicians _____

c. Other Type Work _____

CRITERION ASSESSMENT - OPTIMUM LEARNING SYSTEM

5.2 How many of your graduates were not able to find employment?

6.1 How many of your graduates successfully met their objectives?

a. College Preparatory? _____

b. Technical Training _____

c. Employment _____

Overall Average _____

8.1 List the names of your science teachers who taught any of the students who were unsuccessful in reaching their post-graduation goals under the following categories:

a. College Preparatory

b. Technical Training

c. Employment

8.2 Prepare a list of all science classes taught under your supervision last year, including the number of students in each class and the name of the teacher.

8.3 Using the information compiled in 8.1, list your science teachers in order of seniority, the classes taught by each one, the number of students in each class, and add the average grade for each class. (The following format should be used)

TEACHER	CLASS	NO. OF STUDENTS	AVERAGE GRADE

CRITERION ASSESSMENT - OPTIMUM LEARNING SYSTEM

19.1 Write a memorandum to be sent to each science teacher under your supervision requesting a student learning analysis for each major subdivision of each course. The subdivisions may be taken from course outlines, chapters or sections of a text, or - if necessary, material covered in each reporting period,

OR

Write an announcement stating that you will request this same information at the next science teacher's staff meeting.

19.2 Using the list prepared in 8.3 as a reference, add the major subdivisions of each class and the average grade for each subdivision. (Note how the grade was obtained in each class.)

20.1 Write a paragraph describing the degree of involvement of the science teachers in this evaluation process.

21.1 Prepare a list of the weakest subdivisions for each course and, working with the teacher(s) involved, plan immediate remedial action for these areas. Outline the plan. (Note: This doesn't mean the development of learning modules)

22.1 Working with the appropriate teacher(s), and using the courses' outline, prepare criterion test items that thoroughly describe the learning desired for students in each instance.

23.1 Apply criterion tests to the on-going classes being taught by traditional methods and record the results in the same format as the one you used in 19.2.

CRITERION ASSESSMENT - OPTIMUM LEARNING SYSTEM

24.1 Prepare a tabular comparison of criterion test type of evaluation with the traditional type of evaluation on major course subdivisions.

26.1 Cooperatively with the teacher(s) begin to prepare learning modules for areas of weakness identified by the results of the criterion tests. Prepare a copy of each learning module developed.

27.1 Try out the learning module(s) on a small group of students, preferably those in need of remedial work, using the criterion test(s) for validation. List the results, item by item, on one of the criterion test forms.

27.2 If there are items in the learning module that are not providing the learning experiences required, modify them until the desired results are attained. Submit a copy of the original module along with the modified one, giving the criterion test results for each.

31.1 Outline your plans for incorporating the validated learning modules into the curriculum, and indicate the sequential order of development of other learning modules leading to a complete learning system in science.

33.1 Prepare a flowchart indicating the major events (circles) and the required activities (arrows) in order to complete a validated learning system for science.

CRITERION ASSESSMENT - OPTIMUM LEARNING SYSTEM

33.2 Over the arrows, estimate the time required for each activity, then compute the estimated date of completion of the system. (Use 0.2 for 1 day - 1.0 for 1 week, etc.)

CRITERION ASSESSMENT - EQUIPMENT, SUPPLIES, & MATERIALS

3.1 Start a 3" X 5" index file of equipment, supplies, & materials that it would be nice to have.

3.1.1 Prepare a memorandum to your science teachers asking them to provide feeder information into this file.

3.1.2 Prepare a sample 3" X 5" card, to be attached to your memorandum, showing the format in which you desire to have the information presented.

3.1.3 Be sure that information from the following activities gets into the file:

4. Attending exhibits.
5. Visits from salesmen.
6. Visits to other schools.
7. Activities of staff members.
8. Perusal of catalogs.
9. Professional organizations and journals.

12. Identify all storage space currently available for storage of equipment, supplies and materials.

12.1 Describe area.

12.2 Square footage.

13. Identify all space currently available for utilization of equipment, materials, and supplies.

13.1 Indicate how this space is being used.

13.2 Indicate how it might be used to better advantage.

CRITERION ASSESSMENT - EQUIPMENT, SUPPLIES, & MATERIALS

14. Add to 13 the utilities available in each area.

15. Compare the needs (identified in optimum learning system development) with the index file (3.1), and list the most desirable items.

    15.1 Using constraints described in 12, 13, and 14, cut the list down to those items that are feasible.

    15.2 Prepare a recommendation for the purchase of new equipment, supplies and materials with justification for each new major item.

        15.2.1 Indicate degree of staff involvement.

        15.2.2 Indicate method of staff involvement.

16. Prepare standards for new equipment, supplies, & materials. (Submit one to us)

17. Prepare requests to State Department of Education for proposals and/or requests for bids. (Submit one to us)

18. Prepare orders. (Submit copy to us)

19. Write a paragraph or two describing your system for recording such items as:

    19.1 Dates of deliveries.

    19.2 Checking of items delivered.

20. List all major pieces of equipment and your preventive maintenance schedule for each, including your inventory of spare parts.

CRITERION ASSESSMENT - EQUIPMENT, SUPPLIES, & MATERIALS

21. Send us a copy of your inventories.

23. Describe your distribution and reporting procedures.

    23.1 Do students operate the equipment?

    23.2 Is any of the equipment mobile?

24. How do you orient members of your staff to new equipment and its uses?

25. Prepare a total budget for equipment, supplies, & materials referring to items 15, 20, 21, and 23.